

C. G. BELMER.
HEEL BURNISHING TOOL.
APPLICATION FILED APR. 25, 1907.

937,355.

Patented Oct. 19, 1909.
2 SHEETS—SHEET 1.

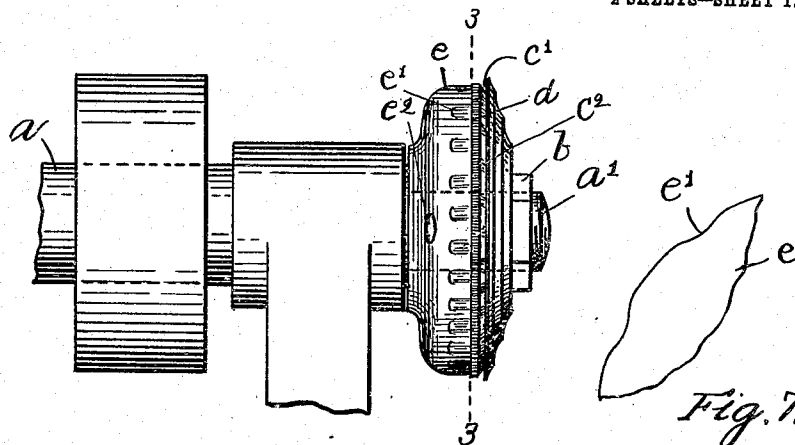


Fig. 1.

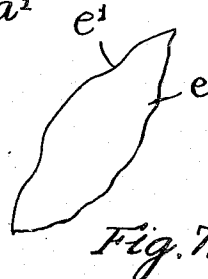


Fig. 7.

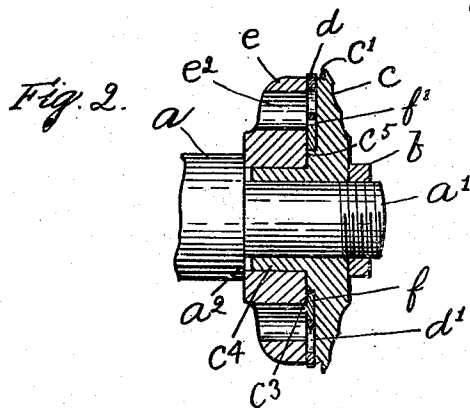


Fig. 2.

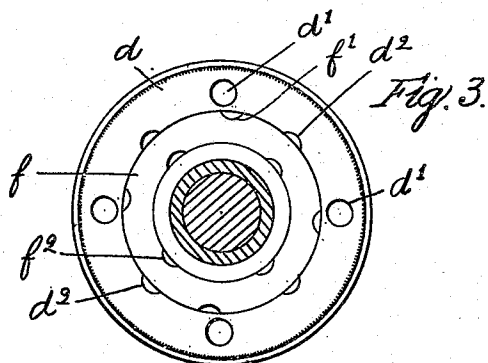


Fig. 3.

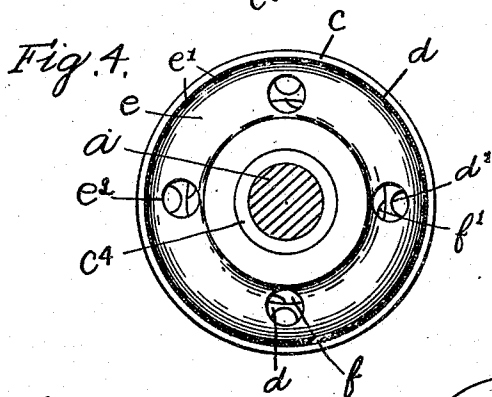


Fig. 4.

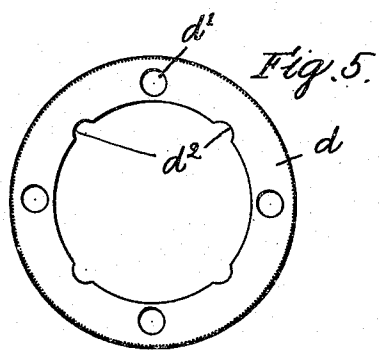


Fig. 5.

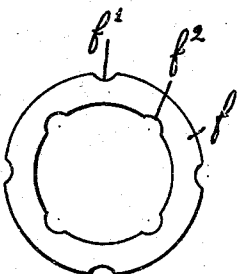


Fig. 6.

Witnesses:
H. B. Davis.
Cynthia Doyle.

Inventor:
Chas. G. Belmer
by *[Signature]*
Attys

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2 SHEETS—SHEET 2.

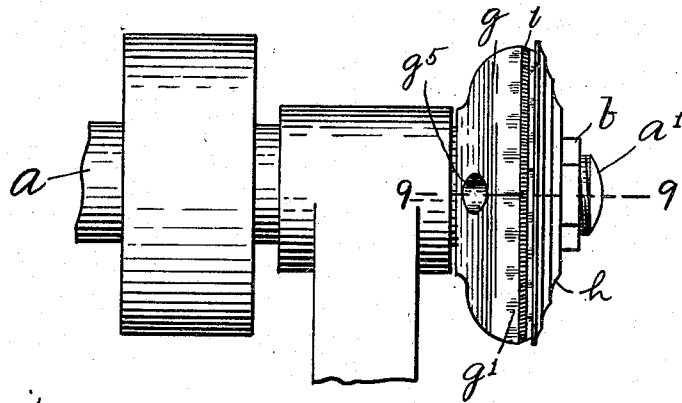


Fig. 8.

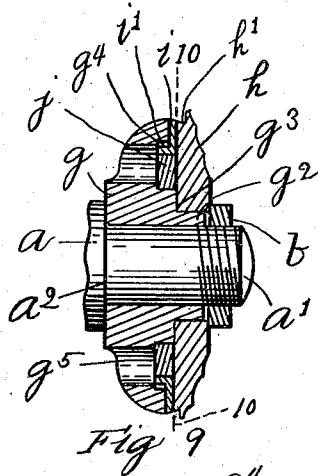


Fig. 9.

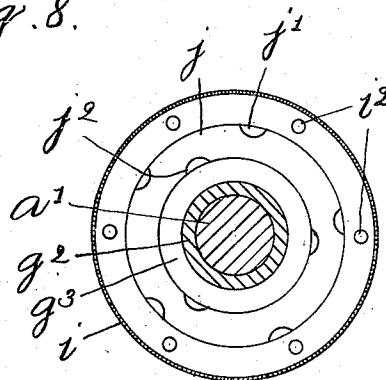


Fig. 10.

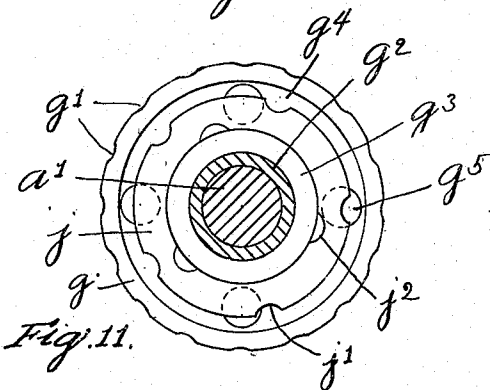


Fig. 11.

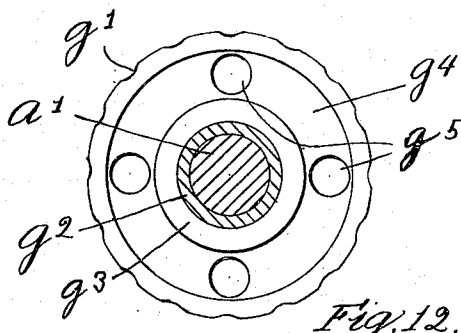


Fig. 12.

Witnesses:
H. B. Davis.
Cynthia Doyle.

Inventor:
Chas. G. Belmer
by August Hamman
Atty's

UNITED STATES PATENT OFFICE.

CHARLES G. BELMER, OF HAVERHILL, MASSACHUSETTS, ASSIGNOR TO JOSEPH HEWETT, TRUSTEE, OF BROCKTON, MASSACHUSETTS.

HEEL-BURNISHING TOOL.

937,355.

Specification of Letters Patent.

Patented Oct. 19, 1909.

Application filed April 25, 1907. Serial No. 370,157.

To all whom it may concern:

Be it known that I, CHARLES G. BELMER, of Haverhill, county of Essex, State of Massachusetts, have invented an Improvement in Heel-Burnishing Tools, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

10 This invention relates to a form of rotary burnishing tool adapted to finish the surface of a heel and form an indented or knurled bead or band on the heel close to the upper. Devices of this character which have been
15 previously employed comprise the circular burnishing iron, which is connected to the shaft and rapidly rotated to polish the surface of the heel, in connection with an indenting wheel which rotates freely with relation to and about the axes of the iron,
20 so that it may be held in engagement with the heel and rolled over the surface thereof close to the upper, as the shoe is turned by the operator to perform the burnishing operation. With these devices the heel has
25 often been damaged by reason of the clogging of the indenting wheel, so that it is caused to rotate by the rotating iron, and to dig out a groove in the heel instead of indenting it. This clogging is usually
30 caused by the wax in the heel dressing which runs in between the indenting wheel and the rotating iron, preventing free relative rotation of the wheel.

35 In this connection one of the objects of my invention is to provide a form of burnishing iron of the above described character with means whereby clogging of the indenting wheel by wax will be prevented.

40 In finishing a heel it is customary to beat the leather of the heel up to the upper, so as to make a close joint therebetween, this operation ordinarily being performed by hand with a hammer.

45 In this connection, a further object of my invention is to perform the burnishing and beating operation simultaneously. In accomplishing this object I provide the surface of the burnishing iron with gradual indentations, so that its surface is undulating and will deliver a rapid succession of blows to the surface of the heel as it is burnished,
50 thus beating the leather up to the upper. I have found, however, that if the indenta-

tions are far enough apart to provide a 55 suitable polishing surface therebetween the blows with which the heel is struck will be too heavy to produce satisfactory results.

In this connection, a further object of my invention is to provide a form of burnishing 60 iron which is adapted to beat the leather up to the upper during the burnishing operation without striking blows on the heel which will be of sufficient force to damage the heel or to interfere with the burnishing 65 operation.

I accomplish these objects by the means shown in the accompanying drawing, in which,

Figure 1 is a side elevation of a rotary 70 burnishing tool made according to my invention. Fig. 2 is a central longitudinal section thereof. Fig. 3 is a sectional view upon the line 3—3 of Fig. 1. Fig. 4 is a rear end elevation of the tool. Figs. 5 and 6 are detail views of the parts of the 75 indenting wheel. Fig. 7 is a somewhat enlarged view, partly broken away, of the front end of its burnishing iron. Fig. 8 is a side elevation of the modified form of my 80 device. Fig. 9 is a central longitudinal section on the line 9—9 of Fig. 8. Fig. 10 is a cross section on the line 10—10 of Fig. 9. Fig. 11 is a similar view showing the indenting wheel removed, and Fig. 12 is also a 85 similar view showing both wheel and bearing ring removed.

As shown in the drawing, the shaft *a* is provided with the usual reduced end portion *a'* on which a nut *b* is threaded, said shaft 90 having a shoulder *a*² at the end of said reduced portion.

A shield or guard-member *c* is provided, similar to that ordinarily employed with an edge trimming cutter and having the lip at 95 its edge adapted to run between the upper side of the heel and the upper. A burnishing portion *c'* is provided on the inner side of the shield, closely adjacent the edge of the lip, the burnishing surface thereof being 100 provided with a regular series of indentations or depressions *c*². Said shield is also provided with a bearing face *c*³ and a projecting sleeve portion *c*⁴, a shoulder *c*⁵ being provided therebetween. An indenting wheel 105 or ring *d*, having a milled or knurled edge, is rotatably mounted between the shield *c* and the circular heel-burnishing member or

iron *e*, and upon the edge of a bearing ring *f*, the latter being in turn rotatably mounted on the bearing face *c*³. The iron *e* is mounted on the sleeve *c*⁴ and is adapted to be clamped between the shoulder *c*⁵ on the shield and the shoulder *a*² on the shaft by means of the nut *b*, so that both the iron and shield will be firmly clamped together, and to the shaft. The width of the face *c*³ is made slightly greater than the thickness of the wheel *d*, and ring *f*, so that they may both be free to rotate between the iron *e* and shield *c* when the latter are clamped in position. A series of indentations *e'* are also formed in the burnishing surface of the iron *e*, as shown in Figs. 1, 4 and 7, said indentations *e'*, of the iron, and *c*², of the shield, being equally spaced apart and of the same depth and width, and the surfaces thereof being practically continuous with the adjacent burnishing surfaces, as shown in Fig. 7. In clamping the shield and iron together upon the shaft, they are so set with relation to each other that the indentations of one are opposite the middle of the burnishing surfaces of the other, as shown in Fig. 1, so that the burnishing surface of one will be in engagement with the work when a depression in the other is opposite the work, or the burnishing surface adjacent thereto comes into engagement with the work. With this arrangement the work is supported by a burnishing surface at some point, at all times, so that the force of the blows, which are successively delivered by the burnishing surfaces as they come into engagement with the work, is much less than if the depressions were directly opposite each other. The beating operation is thus accomplished simultaneously with the burnishing operation, although the blows are not of sufficient force to dent or roughen the heel or interfere with the burnishing operation.

The wheel or ring *d* is provided with a series of holes *d'* which extend completely therethrough approximately midway between the outer and inner edges thereof, and the inner edge or bearing surface thereof is provided with a series of recesses *d*², as shown in Figs. 3 and 5. The outer and inner edge portions of the ring *f* are also provided with a series of recesses *f*¹, *f*², respectively, similar to the recesses *d'*, as shown in Figs. 3 and 6. The iron *e* is provided with a series of holes *e*² which extend axially entirely therethrough, said holes being of sufficient size to register, in part or in whole, with all of the holes *d'* and the recesses *d*², and *f*¹. The object of these recesses and holes is to provide spaces for the accumulation of the hot or melted wax which may be forced in between the wheel or ring *d* and the adjacent burnishing members, and which, if permitted to accumulate between the bear-

ing surfaces, would greatly impede or prevent the relative free rotation above described.

With the above described construction, the wax not only accumulates in the recesses and holes above described, but is permitted subsequently to escape through the holes *e*² in the iron, as rapidly as it accumulates, so that free relative rotation of the parts will not be prevented thereby.

The object of making the indenting wheel in the two parts *d* and *f* is for the purpose of permitting rotation of the outer ring *d* upon the inner ring *f*, in case the bearing of the latter upon the face *c*³ becomes obstructed, and of permitting it to rotate upon said face *c*³ in case its bearing on the edge of the inner ring *f* becomes obstructed.

In Figs. 8 to 12 I show a form of my invention which, for certain reasons, I consider preferable to the form already described. In this form of my invention, the burnishing member or iron *g*, which performs a similar function to the iron *e*, already described, is provided with an indented or undulating burnishing surface *g'* similar to that already described, but, instead of providing the sleeve upon the shield, I provide a sleeve *g*² upon the iron which projects therefrom, a shoulder *g*³ being provided at the end of said sleeve, against which a shield *h*, which is adapted to fit on said sleeve, is clamped by the nut *b*, and, as the thickness of said shield is somewhat greater than the length of said sleeve, said nut not only acts to clamp the shield and iron together, but also acts to clamp the iron against the shoulder *a*², on the shaft, so that the result is the same as in the form of my invention already described.

The face of the iron *g* next to the shield *h* is provided with an annular recess *g*⁴, forming a bearing surface at the inner periphery thereof, said bearing surface extending beyond the face of the iron adjacent the shield a distance slightly greater than the thickness of the indenting wheel which is to be employed, and an indenting wheel *i*, having a milled or knurled edge, is provided between said iron and said shield. A bearing ring *j*, preferably of brass, is rotatably mounted upon the bearing of the iron, the thickness of said ring *j* being slightly less than the length of said bearing so that said ring will be free to rotate thereon when the iron and shield are clamped together. The indenting wheel *i* is provided with an annular rib *i'* at its inner edge which projects therefrom to an extent nearly equal the depth of groove *g*⁴, so that it is thus provided with a bearing surface of the same width as the width of that provided on the outer periphery of the ring *j*. The thickness of said rib *i'* is somewhat less than the distance between the outer surface of the

ring j and the outer side of the annular groove g^4 , so that a space is provided between said rib i' and the outer side of said groove g^4 , as shown in Fig. 9, which may serve as an oil chamber and in which the wax may accumulate.

The shield h is provided with an indented or undulating burnishing portion h' , similar to that of the iron g and having the indentations therein alternately arranged with relation to the indentations of the iron as before described. The ring i is provided with a series of wax receiving apertures or recesses i^2 and the inner and outer peripheries of the bearing ring j are also provided with wax receiving recesses j' , j^2 , while the iron g is provided with a series of apertures g^5 through which the wax may escape, as in the form of my invention already described.

With the form of my invention last described I am enabled to provide a much broader bearing surface for the indenting wheel or ring than I am enabled to provide with the other form of my invention, so that the bearing surfaces become worn much more slowly, and the wheel is much more effectively held against lateral tipping than in said other form, thus greatly lessening the friction.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A rotary burnishing tool comprising a pair of members, one circularly adjustable with relation to the other, and each having indented burnishing surfaces adjacently disposed, to operate simultaneously upon the work, substantially as described.

2. A rotary burnishing tool comprising a pair of members each having a circular series of burnishing faces disposed adjacent each other to operate upon the work and each face of one series being arranged in advance of the adjacent face of the other series to cause alternate engagement thereof with the work, substantially as described.

3. A rotary burnishing tool having two adjacently disposed burnishing surfaces, each of said surfaces having a series of indentations disposed opposite the burnishing portions of the other, whereby the work will be struck alternate blows by the burnishing portions of said surfaces, substantially as described.

4. A rotary burnishing tool comprising a pair of members, one circularly adjustable with relation to the other, and each having a series of burnishing faces adjacently disposed to operate simultaneously upon the work, the faces of one series being arranged out of axial alinement with the faces of the other series, substantially as described.

5. A heel finishing tool comprising a pair of rotary burnishing members each having indented burnishing faces with the indenta-

tions of one face opposite the burnishing portions of the other face and a relatively rotatable indenting wheel mounted between said members adjacent said faces to permit said members and said wheel to operate simultaneously upon the work, substantially as described.

6. A rotary burnishing tool comprising a pair of rotary burnishing members and a relatively rotatable indenting wheel mounted between said members, one of said members being circularly adjustable with relation to the other and each having indented burnishing surfaces arranged adjacent opposite sides of the work-engaging surface of said wheel to permit all of said surfaces to operate on the work simultaneously, substantially as described.

7. A heel finishing tool comprising a rotary burnishing member having a relatively rotatable indenting wheel mounted closely adjacent thereto, said wheel having a wax-collecting recess therein opening to the adjacent side of said member, said member having an aperture leading therethrough and disposed to register with said recess in certain positions of said wheel, substantially as described.

8. A heel finishing tool comprising a rotary burnishing member having a relatively rotatable indenting wheel mounted closely adjacent thereto, said wheel and said member each having wax-receiving recesses in their adjacent sides disposed to be brought into register in certain relative positions thereof, substantially as described.

9. A heel finishing tool comprising a rotary burnishing member having a relatively rotatable indenting wheel mounted closely adjacent thereto, said wheel having a wax-collecting recess in the axial bearing surface thereof and said member having a wax-receiving recess in its side adjacent said wheel disposed to be brought into register with said recess of said wheel in certain relative positions thereof, substantially as described.

10. A heel finishing tool comprising a rotary burnishing member having a peripheral burnishing face, and a relatively rotatable indenting member mounted closely adjacent one side thereof with its axial bearing face terminating at the side of said burnishing member, said burnishing member having an aperture leading axially therethrough, within its burnishing face, to the end of said bearing face of said indenting member, to receive obstructing substances and conduct them from said bearing face to the opposite side of said burnishing member, substantially as described.

11. A heel finishing tool comprising a rotary burnishing member having a peripheral burnishing face and a radial bearing face, and an indenting member having a pe-

ripheral indenting face, and said indenting member being rotatably mounted at one side of said burnishing member and having a radial bearing face held in engagement with
 5 the bearing face of said burnishing member, and one of said members having an aperture leading axially therethrough within its work-engaging face to said bearing faces to receive obstructing substances from be-
 10 tween said bearing faces and conduct them to its opposite side therefrom, substantially as described.

12. A heel finishing tool comprising a rotary burnishing iron having a relatively rota-
 15 tatable indenting wheel mounted closely adjacent thereto, said wheel having a wax-receiving recess formed in the axial bearing surface thereof throughout its length, substantially as described.

20 13. A heel finishing tool comprising a rotary burnishing iron having a relatively rotatable indenting wheel mounted closely adjacent thereto, said wheel having a wax-re-
 25 ceiving recess therein, and said iron having means for permitting the escape of wax from said recess, substantially as described.

14. A heel finishing tool comprising a rotary burnishing iron having a relatively rota-
 30 tatable indenting wheel mounted closely adjacent thereto, said wheel having a wax-receiving recess formed in the bearing surface thereof, and said iron having an aperture therethrough to permit the escape of wax
 35 from said recess, substantially as described.

15. A heel finishing tool comprising a rotary shaft having a burnishing iron and an edge guard rigidly mounted thereon, and an indenting wheel having an axial bearing face on which it is rotatably mounted between

said iron and said guard and said face hav- 40
 ing a wax-receiving recess therein, extending from end to end thereof, substantially as described.

16. A heel finishing tool comprising a rotary shaft having a burnishing iron and an 45
 edge guard rigidly mounted thereon, and an indenting wheel rotatably mounted between said iron and said guard having side faces which engage the adjacent sides of said iron and guard, and having a wax receiving re- 50
 cess leading from said faces, substantially as described.

17. A heel finishing tool comprising a rotary shaft having a burnishing iron and an 55
 edge guard rigidly mounted thereon, and an indenting wheel rotatably mounted between said iron and said guard having side faces which engage the adjacent sides of said iron and guard and having wax receiving recesses extending therethrough to the opposite side 60
 faces thereof, substantially as described.

18. A heel finishing tool comprising a rotary burnishing iron having a relatively rota-
 65 tatable, indenting wheel mounted closely adjacent thereto, said wheel having a wax-receiving recess formed in the bearing surface thereof, and said iron having an aperture therethrough disposed to be held in register with said recess to permit the escape of wax therefrom, substantially as described. 70

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

CHARLES G. BELMER.

Witnesses:

L. H. HARRIMAN,
 H. B. DAVIS.