Nov. 9, 1937. S. T. FREAS 2,098,865

ROTARY FILE

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Fig. 1.

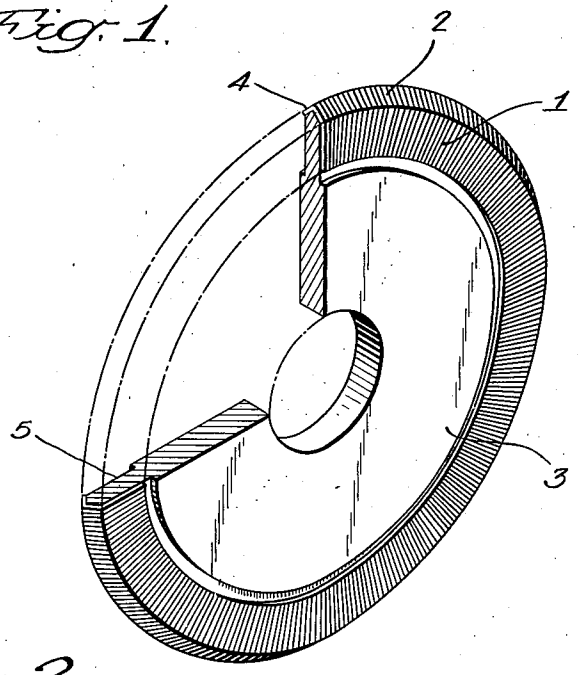

Fig. 2.

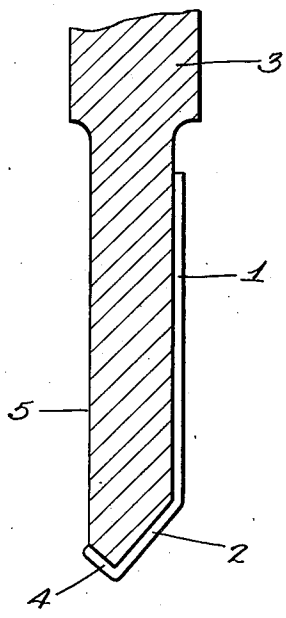

Fig. 2a.

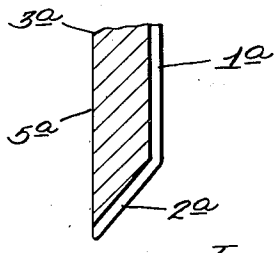

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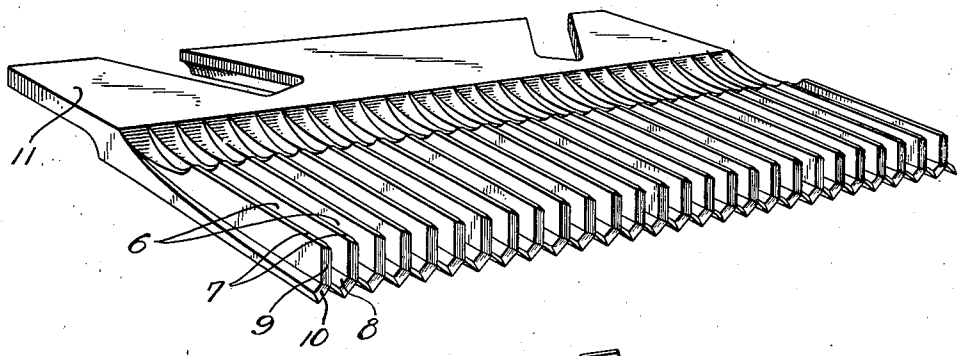
Fig. 3.



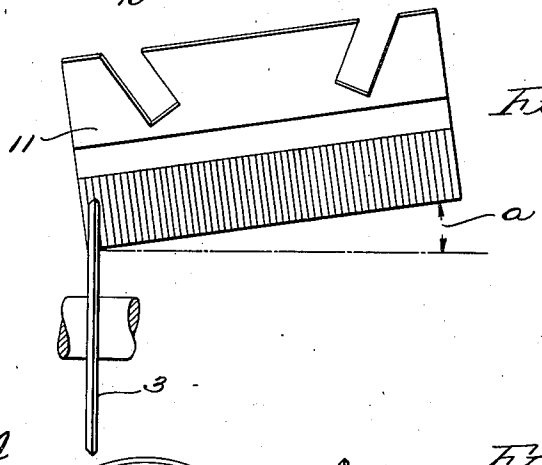


Fig. 5.

Fig. 4.

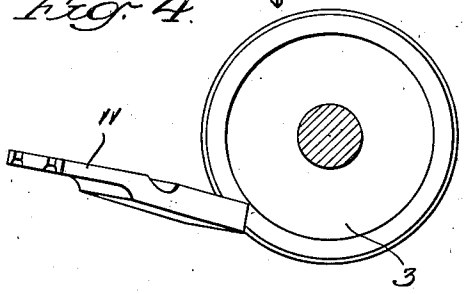


Fig. 6.

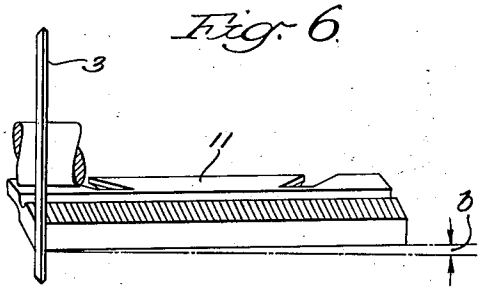


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Fig. 7

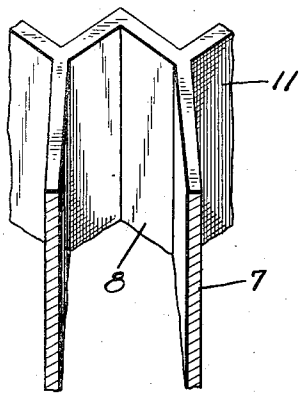


Fig. 8.

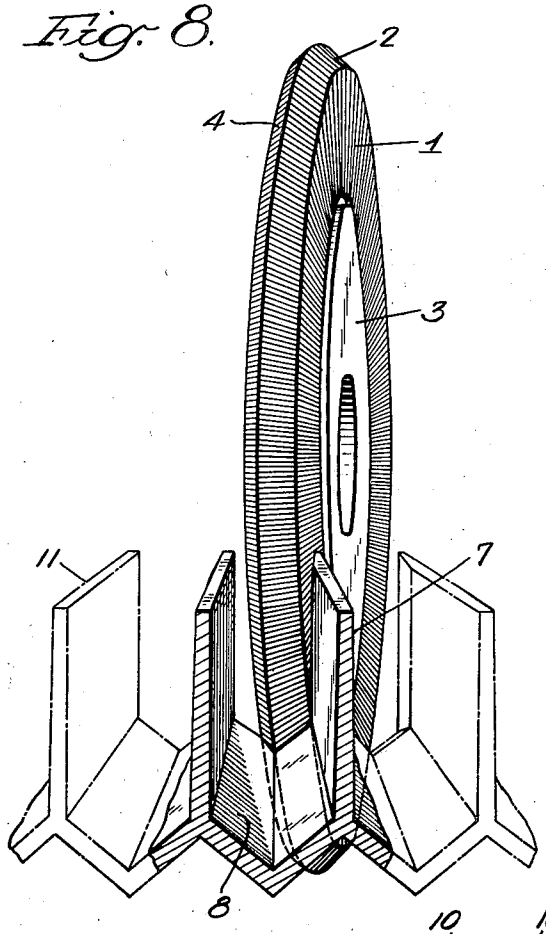


Fig. 9.

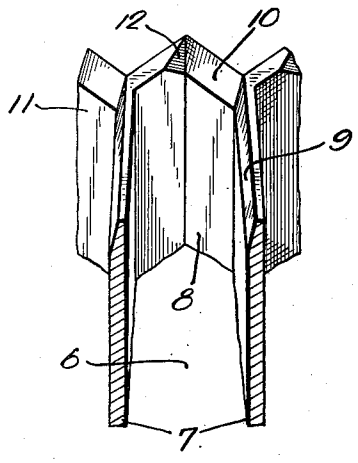
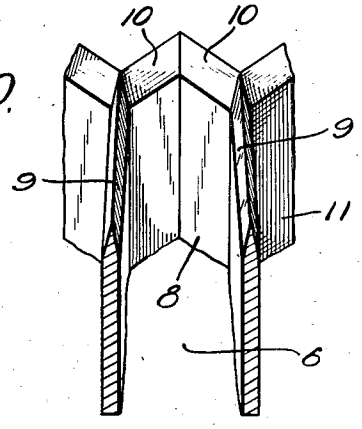


Fig. 10.



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Patented Nov. 9, 1937 2,098,865

UNITED STATES PATENT OFFICE

2,098,865

ROTARY FILE

Samuel T. Freas, Trenton, N. J., assignor to Henry Disston & Sons, Incorporated, Tacony, Pa., a corporation of Pennsylvania

Application February 12, 1937, Serial No. 125,510

2 Claims. (Cl. 29—78)

This invention relates to improvements in rotary files, and more particularly in files of the type used for sharpening beet knives in accordance with the general principles set forth in United States Patent No. 2,069,140, dated January 26, 1937.

The prior form of rotary file used to form the bevels at the cutting edges of beet knives has been relatively inefficient by reason of inability to stand up under normal working conditions, and a principal object of the present invention is to provide a rotary file of novel form having a considerably longer useful life than the prior files of the same class, and which shall be capable of a relatively extended continuous use in the filing operation.

Another object of the invention is to provide a file that shall be more efficient in operation and capable of producing generally improved and more precise results.

In the attached drawings:

Figure 1 is a sectional perspective view of a file made in accordance with my invention;

Fig. 2 is an enlarged fragmentary sectional view of the file;

Fig. 2*a* is an enlarged fragmentary sectional view illustrating a file of modified form and characteristics;

Fig. 3 is a view in perspective of a beet knife of conventional form;

Figs. 4, 5 and 6 are more or less diagrammatic views illustrating the manner in which the beet knife is presented to the file in the sharpening operation, and

Figs. 7, 8, 9 and 10 are fragmentary sectional views illustrating the various operations of the sharpening process.

With reference to Figs. 1 and 2 of the drawings, a file made in accordance with my invention comprises principal filing surfaces 1 and 2, the surface 1 being formed on one side face of the blade 3, and the surface 2 being formed at the beveled periphery of the blade and extending at an angle to, and constituting in effect a continuation of, the surface 1. The angular relation between the surfaces 1 and 2 may vary, the standard included angle between these surfaces being 50°, and in practice it is customary to furnish these files with bevel angles of both 50° and 45°. Other angles may be used without departure from the invention.

In accordance with my invention, I provide a third filing surface 4 which is formed on a reverse bevel extending from the outer end edge of the filing surface 2, and the included angle between the bevel surface 4 and the adjoining face 5 of the blade 3 is greater than the included angle between the filing surfaces 1 and 2. Where the latter angle is 50°, the included angle between the filing surface 4 and the adjoining face of the blade may suitably be in the neighborhood of 40°. It will be noted that the aforedescribed construction provides a continuous filing surface embracing the adjoining angularly disposed surfaces 1, 2 and 4.

The invention resides in the provision of the filing surface 4. Heretofore it has been customary to produce these knives, as illustrated in Fig. 2*a*, with only the filing surfaces 1*a* and 2*a*, corresponding with the surfaces 1 and 2 described above. In this case also, the side surface 5*a* at the opposite side of the blade 3*a* from the filing surface 1*a* extends flatly to the outer edge of the filing surface 2*a*. As set forth above, files of this prior character tend to deteriorate relatively rapidly in use. I have discovered that by providing the additional filing surface 4, as described above, the characteristics of the tool as to durability, and also in certain other respects hereinafter set forth, are materially improved.

The function and mode of operation of the file, and specifically of the supplemental filing surface 4, will be more readily understood from a consideration of the other figures of the drawings. In Fig. 3, I have shown a beet knife of conventional form comprising the typical V-bottom channels 6, the sides of which are formed by the splitter blades 7. The outer end edges of the splitters 7 are beveled as indicated at 9 to produce the sharp cutting edges of the splitter elements, and it is the function of the filing surface 1 of the file to produce these bevels, it being understood that right- and left-hand files are provided to form the bevels at the respective opposite sides of the splitters. The end edges of the V-shaped bottoms of the channels 6 are correspondingly beveled, as indicated at 10, and these bevels are produced by the filing surface 2 of the file. With a file made in accordance with my invention, the cuts on each bevel 9 and the adjoining bevel 10 are made in a single pass of the file, two operations, performed respectively by the right- and left-hand files, being required to form the bevels 9 and 10 on opposite sides of each channel.

In filing the bevels, a relationship between the file and the beet knife such, for example, as shown in Figs. 4, 5 and 6, is maintained. In a filing machine of the character disclosed in the aforesaid United States patent, the beet knife

designated in Figs. 3 to 6, inclusive, by the reference numeral 11, is presented to the file 3 in a position, such as shown in Fig. 4, calculated to produce a bevel 10 of desired length at the edges of the V-shaped bottoms of the channels 6. Similarly and as shown in Fig. 5, the presentation of the knife to the file is at an angle *a* calculated to produce a given length of bevel 9 on the splitters 7. A second angular relation between the beet knife and the file is provided for to compensate a slight taper in the splitters 7 from their bases toward their tops, see Fig. 7, and this angular relation is indicated at *b* in Fig. 6.

In Fig. 8, I have illustrated the relative positions of the file and the beet knife in cutting the bevels 9 on one side of a splitter 7 and the adjoining bevel 10 on the contiguous side of the V-bottom 8, it being noted that the two bevels are formed simultaneously by the filing surfaces 1 and 2 of the file 3. Fig. 7 shows the end edges of the blade prior to the filing operation, and Fig. 9 the same edges subsequent to the filing operation illustrated in Fig. 8. In this latter figure, it will be noted that in addition to the bevel 9 on the splitter 7, and the bevel 10 at one side of the V-bottom 8, an additional bevel cut 12 is produced on the oppositely inclined side of the V-bottom by the filing surface 4 of the file. When in a subsequent operation the bevels 10 and 9 are produced at the opposite side of the channel 6, as shown in Fig. 10, the filing surface 4 of the file used in that operation does not function, since by reason of its angular position in the file, it fails to contact the opposite and previously formed bevel surface 10.

The difficulties that have been experienced with the form of file, illustrated in Fig. 2, arise from the fact that in that case the extreme peripheral edge of the file at the outer end of the filing surface 2*a*, being attenuated and relatively weak, was unable adequately to support the imposed load. Furthermore, the conditions under which this part of the file was required to operate, without relief in the angle of the V-shaped bottoms of the channels, imposed exceptional loads upon this relatively weak part. This was manifested by a tendency of the narrow peripheral rim of the file to bind in the work. These prior files also exhibited a tendency to deflect from their normal path in the work, with resulting slight inaccuracies of cut. As a result of these conditions, the files in operation exhibited rapid deterioration at the periphery, and their useful life was correspondingly limited.

In files made in accordance with my invention, all portions of the filing surfaces operate under fully relieved conditions. Specifically, the presence of the filing surface 4 functions to relieve the attenuated peripheral rim portion. Not only is all tendency of this portion of the file to bind in the work avoided, but the file shows no tendency toward deflection. The useful life of the file is, thus, materially extended, and the precision characteristics substantially improved.

I claim:

1. A rotary file for sharpening beet knives and the like, said file comprising a circular disk blade having in the peripheral portion thereof a radially disposed filing surface, a beveled filing surface adjoining the outer edge of said radial surface and extending at a predetermined angle to the latter, the outer edge of said bevel surface forming the extreme periphery of the blade, and a reversely beveled filing surface extending from said extreme periphery.

2. A rotary file for sharpening beet knives and the like, said file comprising a circular disk blade having in the peripheral portion thereof a radially disposed filing surface, a beveled filing surface adjoining the outer edge of said radial surface and extending at a predetermined angle to the latter, the outer edge of said bevel surface forming the extreme periphery of the blade, and a reversely beveled filing surface extending from said extreme periphery, the last-named surface forming with a radial plane intersecting the said extreme periphery an acute angle less than the acute angle formed between said plane and the first-named bevel surface.

SAMUEL T. FREAS.