June 7, 1927.

1,631,212

W. R. KING

FILE

Filed June 17, 1926

Fig. 1.

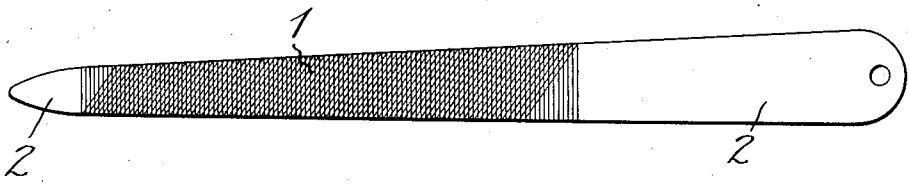


Fig. 2.

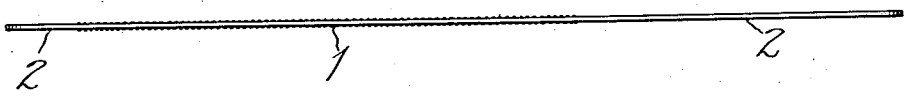
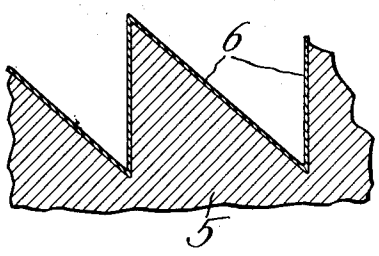


Fig. 3.



WITNESS

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Patented June 7, 1927. 1,631,212

UNITED STATES PATENT OFFICE.

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FILE.

Application filed June 17, 1926. Serial No. 116,609.

In the manufacture of files, it is customary to make the file blanks of soft steel and impress thereon the file teeth after which the files are hardened by heat treatment in the well-known manner. The files when thus hardened have a coating of scale which has to be removed by acid treatment, brushing, washing, etc. In the special case of nail or manicure files, there is sometimes added an electro-deposited coating of nickel and on top of this, a thinner coating of tin to give a white effect. The nickel coating, to be of any value, must be so thick, as, for example, of the order of one thousandth of an inch, that it impairs the sharpness of the file as a certain thickness of deposit will round the sharp edges of the teeth.

In my present invention, I avoid the necessity of hardening by applying a thin electrodeposit of chromium to the file after the teeth have been cut without the usual heat treatment. Chromium has a hardness almost equal to the diamond, being of the order of hardness of 9, so that an extremely thin deposit, as for example less than two ten-thousandths of an inch, may be used and yet furnish an armor that will give an abrasive effect superior to the hardest steel and incomparably more effective than nickel plated steel.

My invention is illustrated in the accompanying drawings in which

Figure 1 is a plan view of a nail file.

Figure 2 is a side view of the same.

Figure 3 is an exaggerated section thru a tooth of the file.

1 is a tooth part of a file which, in the case of nail files, is located between two smooth and blank ends 2. In Figure 3 I have shown on an enlarged scale, a single tooth of the file showing a base of unhardened steel 5 coated with an extremely thin covering of metallic chromium 6, and as will be seen, the sharpness of the tooth is maintained. This sharpness and diamond-like point of the cutting edges of the tooth is extremely important for a file, different from other cutting implements in that it cannot be sharpened by grinding and as it has to be used as it comes from the plating process, it is essential that this last process does not impair the sharpness of the teeth. When the body of the file is hardened as has been the practice heretofore, the file is left in a more or less brittle condition often leading to breakage. With my file, however, there is no brittleness and in many cases, this is of considerable advantage. Although the body of the file is of unhardened steel, the cutting edges of the teeth are harder and more penetrative than any hardened steel can be. In a file of this kind, it will be observed that in one operation I do away with heat-treatment and acid-cleaning, and with one electroplating operation, and that operation a very short one, I produce a completed file having a bright and corrosion resisting surface with sharper and harder points than have heretofore been possible with electroplated files. Moreover the article possesses the novel feature of being unusually flexible, without brittleness and is practically unbreakable in ordinary use.

For the body of the file I may for example use cold-rolled bright steel or other metals or alloys such as bronze. It is a known quality of chromium that its deposit may present the same polish as the article upon which it is deposited. The invention in its broader sense is not necessarily limited to the use of chromium as any metal or alloy having a hardness of the order of 9 or better will serve my purpose if it is electrodeposit-able.

I claim:—

A file comprising a body of soft unhardened metal formed on both sides with teeth and an electroplated coating of chromium deposited on the teeth.

WILLIS R. KING.