No. 858,701. PATENTED JULY 2, 1907.

# H. BROKAMP & C. HAMMERSTEIN.

## PROCESS OF MANUFACTURING RAZOR BLADES.

APPLICATION FILED OCT. 22, 1904.

Fig. 2

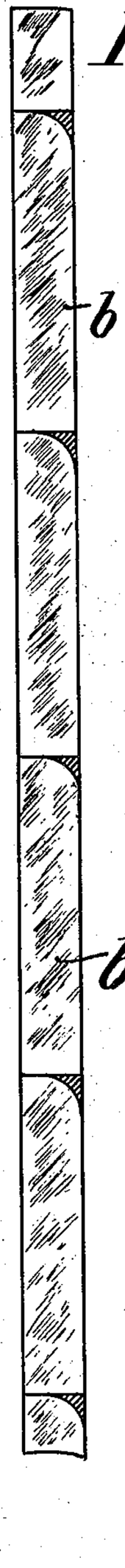


Fig. 1

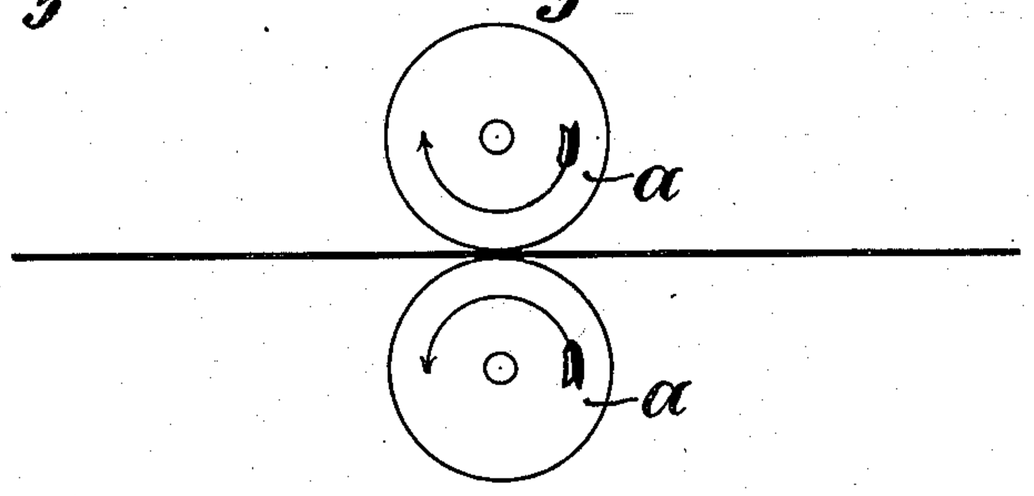


Fig. 3

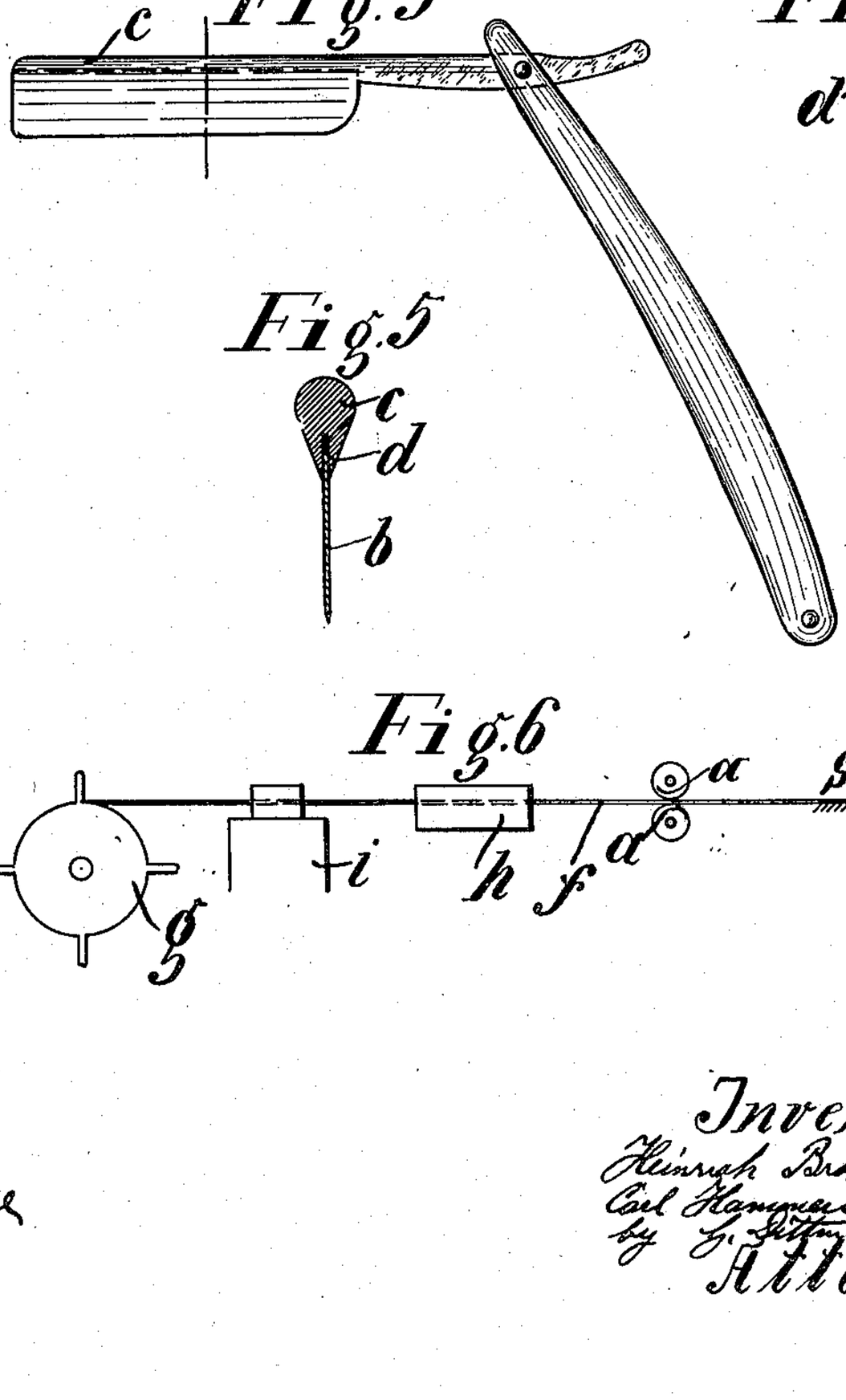


Fig. 4


Fig. 5




Fig. 6




Witnesses
Geo. Heinicke
F. Franke

Inventors
Heinrich Brokamp and
Carl Hammerstein
by G. Seltzer
Attorney.

# UNITED STATES PATENT OFFICE.

HEINRICH BROKAMP AND CARL HAMMERSTEIN, OF MERSCHEID, NEAR OHLIGS, GERMANY.

## PROCESS OF MANUFACTURING RAZOR-BLADES.

No. 858,701. Specification of Letters Patent. Patented July 2, 1907.

Application filed October 22, 1904. Serial No. 229,618.

*To all whom it may concern:*

Be it known that we, HEINRICH BROKAMP and CARL HAMMERSTEIN, both subjects of the King of Prussia, German Emperor, residing at Merscheid, near Ohligs, in the Province of the Rhine, Kingdom of Prussia, German Empire, have invented a new and useful Improved Process for the Manufacture of Razor-Blades, of which the following is a specification.

A process for the production of cheap knife blades is already known which consists in stamping the separate blades out of a steel plate or bar previously slightly hardened, and by grinding or otherwise superficially smoothed, then sharpening them at the cutting edge and fastening them in the handle by means of a simultaneously stamped out tang. A process of this kind cannot be applied to the manufacture of razor blades without further invention because these blades require a hardness which prevents any subsequent stamping, and also must be so ground that the superficial grinding of the whole plate or bar would not suffice even if followed by a second grinding.

The process which is the object of the present invention is carried into effect as follows. A continuous steel band is taken, which band corresponds exactly in width to that of the blades. This steel band which is unwound from a coil is hardened piece by piece to the required degree necessary for razor steel, then passed through grinding rolls *a*, *a* (Figure 1) and finally separated into single rectangular blades corresponding to the length of the respective razor blades; this operation is preferably effected by cutting through. As the one edge of the band coincides with the cutting edge of the finished blade the grinding can be effected in the finest possible manner up to the edge so that the effect of the well known hollow grinding is fully attained. The whole process goes continuously and so to speak automatically forward; the rectangular blades represent without further operation the finished razor blades, or if desired they may be rounded off by grinding or the like at one end so that the part shaded in Fig. 2 is removed. The blades are then ready for use. They are finally inserted separately in special blade backs which can be effected by cementing or soldering according to the material of the back.

Referring to the accompanying drawings: Fig. 1 shows the grinding rolls for the steel band. Fig. 2 shows the steel band after division. Fig. 3 shows the elevation of the finished razor. Fig. 4 the corresponding cross section through the blade. Fig. 5 the same cross section on an enlarged scale. Fig. 6 is a diagrammatical view illustrating the new process.

The arrangement of a special blade back in which the flat cutting blade is inserted is already known. As may be seen from the drawing, the blade back *c* is of the usual configuration and is provided with a longitudinal slot *d* in which the blade *b* is secured by cementing or soldering. By this means a razor blade is obtained which in outward appearance has the well known form of the hollow ground razor blade but is much cheaper than this latter, because not only is the expensive hollow grinding which is chiefly effected in factories, avoided, but also the hardening and the grinding of a continuous steel band by the sub-division of which the separate blades are formed obviously saves much time, labor and trouble. Further there is the advantage over the process already known that the blades are produced of the requisite hardness and sharpness for razors and ready for use, but with hardly any waste of material.

For further explanation of the process the following remarks may be made regarding Fig. 6. The metal band *f* coiled in the well known manner upon a holder *g* passes firstly through a stove *i*, then through a hardening bath *h*, then between the grinding rolls *a*, *a*, upon which it is finally separated by means of the cutter *s* into rectangular blades corresponding in length to the razor blades. As soon as the band has passed under the cutter for the length of a blade, it is separated by the latter.

The grinding rolls can either be constructed tapering or they may be inclined somewhat to one another in order to secure the slightly wedge-shaped cross section of the blade.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

The hereindescribed process of forming razor blades which consists in employing a continuous band corresponding exactly in width to that of the blades, hardening the same piece by piece to the required degree, then grinding, and then separating the band into single rectangular blades.

In testimony whereof we have signed our name to this specification in the presence of two subscribing witnesses.

HEINRICH BROKAMP.
CARL HAMMERSTEIN.

Witnesses:
WILLIAM KUEPPERS,
JOH. SCHOLZ.