

[54] METHOD OF MANUFACTURING OF KNIVES

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[56] References Cited

UNITED STATES PATENTS

361,620	4/1887	Dunn.....	76/104 R
3,616,712	11/1971	Eickhorn.....	76/104 R

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[57] ABSTRACT

A method of producing of knives with a blade compacted by cold working which comprises the steps of compacting the blade of the knives after precision forging of a sling and of a haft by cold-rolling cross-wise to its longitudinal axis with a roll pressure leading nearly to the yield point, and thereafter cutting the same to its outline shape.

2 Claims, 3 Drawing Figures

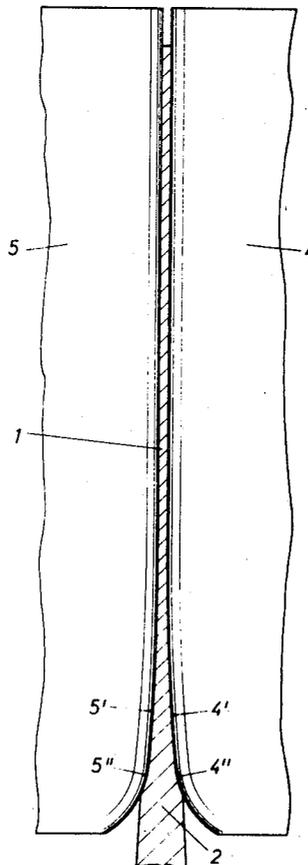
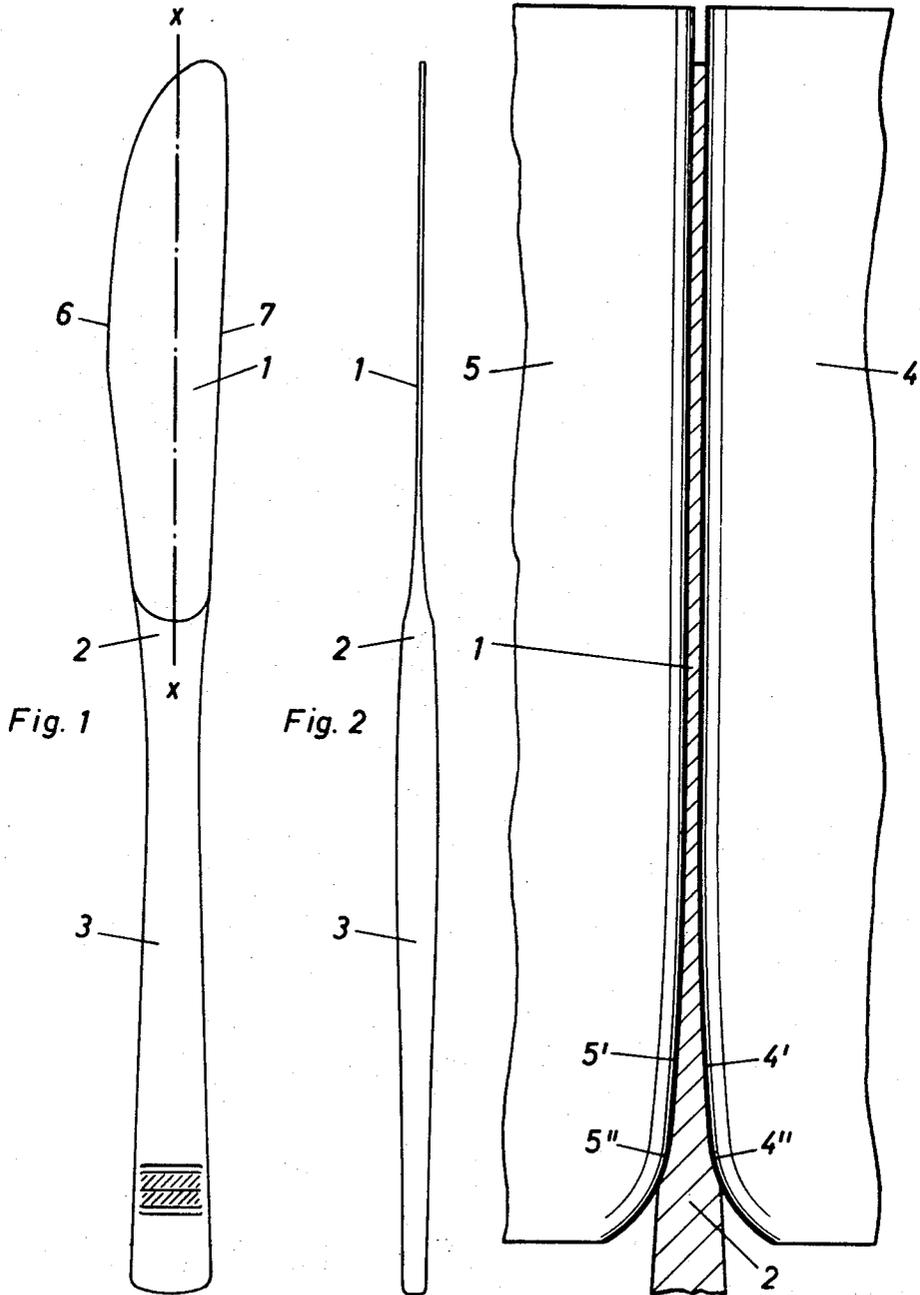


Fig. 3



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METHOD OF MANUFACTURING OF KNIVES

The present invention relates to a method of production of knives, in general and to such method with a blade compacted by cold working, in particular.

The conventional knives blades of non-rusting steel are produced of such steel with relatively high carbon content and are hardened by chilling. Corresponding knives have been found with disadvantage, in particular so far as an appreciable corrosion danger exists, in particular, if the knife is subjected to a certain food and certain cleaning means. The surface of the blade is attacked after a short time. It loses in particular its smooth blank appearance.

In order to be able to use steel with relatively low carbon content, about in the range of 0.05 to 0.1, knives have also been known the blades of which are compacted by cold working. The cold working is performed thereby by means of cold forging into its final form. Numerous experiments have shown, that in this manner no sufficient hardening degree can be obtained. Substantially only a surface hardening takes place.

Concerning the hardness of the blade thus a non-homogeneous structure results. The low obtainable hardening degrees make it necessary therefore, by using these solutions, that the blades must be formed relatively thick, preferably even with the maintenance of a predetermined cross-section such, that the blade is tapered down towards the cutting edge and towards the back and has in the central longitudinal range its greatest thickness.

This is of a disadvantage for the cutting output of the blade. Due to this completely insufficient cold compacting of such blades its hardness is in the range between 20 and 30 HRC, and only a low scratch resistance results, which effects disadvantageously for machine cleansing.

It is one object of the present invention to provide a method of production of knives with a blade compacted by cold working, in which, in order to obtain the extensively completely homogeneous and high grade cold compactness, in spite of simpler production and in spite of selection of steels with low carbon content, by example, chromium-nickel-steel or chromium-manganese-steel, concerning the spatial formation of the blade and concerning its cutting output etc. to a great extent the requirements which are assumed from a chilled-hardened blade, are fulfilled.

It is another object of the present invention to provide a method of production of knives wherein the blade after the form forging of the sling and of the haft and connecting member, respectively, of the blade is compacted by cold rolling cross-wise to its longitudinal axis with a roller pressure leading merely to the yield point and thereafter is cut to its outline shape.

An advantageous solution resides in accordance with the present invention in the fact, that the blade is passed twice through the roller in a position oppositely relative to each other.

Due to this solution a knife with cold compacted blade is created which also in case of production from chromium-nickel-steel or chromium-manganese-steel, which is less attackable by chemical agents, has a blade, the hardening degree and hardening homogeneity is so great, that, as it has been found, without difficulty

the conventional preferred thin blade cross-section can be used, which forms preferably also the conventional cross-section continuously reduced towards the cutting edge. The cutting output is appreciably increased relative to the blade compacted by cold forging. The scratching rigidity is appreciably greater. The handling and easier use is better and also the optical image corresponds due to thinner possible cross-section stronger the conventional expectations of a blade. It has been found that a certain increased cold compactness is present in the favorable manner just in the cutting zone of the blade.

With these and other objects in view, which will become apparent in the following detailed description the present invention will be clearly understood in connection with the accompanying drawing, in which:

FIG. 1 is a front elevation of a knife;

FIG. 2 is a side elevation thereof; and

FIG. 3 is a diagrammatic section, showing a cold rolling process in the formation of the blade.

Referring now to the drawing, the mono-block knife has a blade 1. Following the blade is provided a sling 2 which forms the connection towards the haft 3. If one does not deal with a mono-block knife, the sling 2 leads into the connecting member, which is secured to the haft afterwards. The production of the knife takes place substantially as follows:

An intermediate work piece member is first produced from a corresponding work piece, which comprises preferably chromium-nickel-steel or chromium-manganese-steel, preferably with a carbon content of 0.05 to 0.1 and in particular by form-forging of the sling and of the connecting member and the haft, respectively. After the preforming of the blade sheet thereafter takes place the cold-compacting of the blade 1. This is made by cold rolling cross-wise to the longitudinal axis $x-x$ of the blade and in particular between rollers 4 and 5 the jacket face of which is formed corresponding with the longitudinal profile of the blade 1, thus, for rolling of the blade in accordance with FIG. 1, and particularly the diverging zones 4' and 5' with the following roundings 4'' and 5''.

During this roller process a roller pressure is exerted which leads nearly to the yield point of the metal. The blade 1 is fed preferably twice through the rollers 4 and 5 and in particular in a position oppositely relative to each other, so that thus once a feeding from the cutting edge 6 takes place and the second time a feeding from the back 7 of the blade.

Thereafter, following this working step takes place the form cutting of the blade, in order to produce the outer configuration thereof.

The following working steps, as for instance, sharpening of the cutting edge and providing of the grinding of the cutting edge and application of the cylindrical grinding on the latter and surface refining etc. take place in conventional manner.

While I have disclosed one embodiment of the present invention, it is to be understood that this embodiment is given by example only and not in a limiting sense.

I claim:

1. A method of production of knives with a blade compacted by cold working, comprising the steps of

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compacting the blade of the knives after precision forging of a sling and of a haft by cold-rolling crosswise to its longitudinal axis with a roll pressure leading nearly to the yield point, and thereafter cutting the same to its outline shape.

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2. The method, as set forth in claim 1, which includes the step of feeding twice said blade through rolls in positions turned over relative to each other.

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