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C. FOLTZ ET AL

2,382,304

KNIFE AND METHODS OF MANUFACTURE THEREOF

Filed March 24, 1941

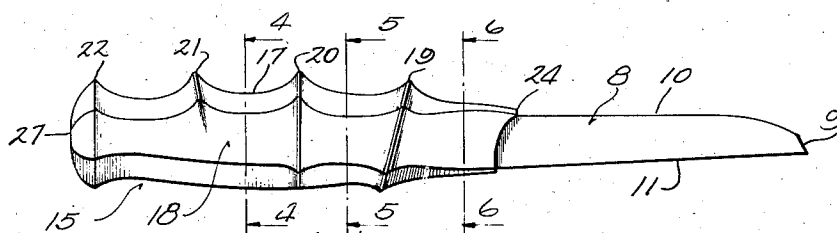


Fig. 1.

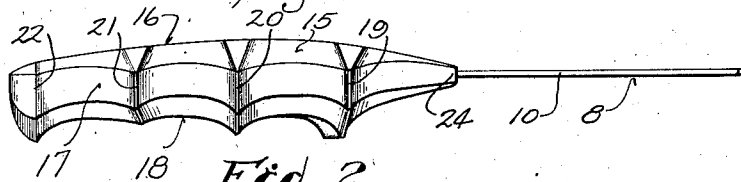


Fig. 2.

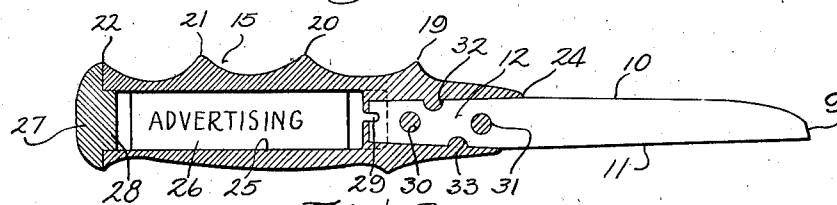


Fig. 3.

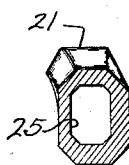


Fig. 4.

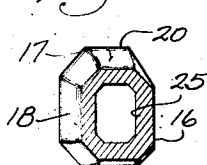


Fig. 5.

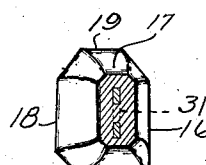


Fig. 6.

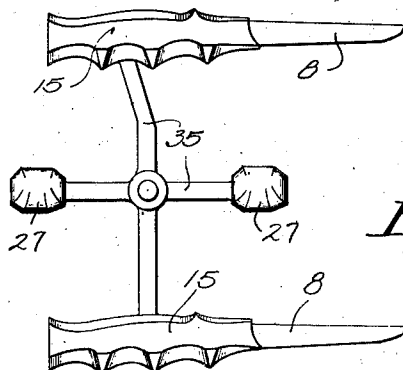


Fig. 7.

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## UNITED STATES PATENT OFFICE

2,382,304

KNIFE AND METHOD OF MANUFACTURE  
THEREOF

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Application March 24, 1941, Serial No. 384,789

6 Claims. (Cl. 30—343)

This invention relates to improvements in knives and methods of manufacture thereof. The present application is a companion to our application entitled Manufacture of knife blades.

It is the primary object of the present invention to provide a method of manufacture and a product assuring a rigid and permanent connection between the blade and a molded, one-piece handle notwithstanding the great difference in coefficients of expansion of the steel used in the blade and the plastic used to constitute the handle. The method and construction herein disclosed are believed to solve for the first time the problem of making a knife by the automatic injection molding of the handle about the blade.

It is a further very important object of the invention to provide a knife with a hollow handle. This is important because the handle serves as a float to prevent the knife from sinking in dish-water or elsewhere. By floating the blade, the handle prevents the accidents which are so commonly experienced when a sharp knife is out of sight below the surface of the water in a dish-pan.

It is a further object of the invention to provide a knife construction in which a hollow handle and the use of a transparent plastic material in the manufacture of the handle permit printed matter to be readily and interchangeably incorporated in the handle, secure against access of water and yet readily visible to the user through the handle.

Other objects will be apparent to those skilled in the art upon study of the following disclosure of the invention.

In the drawing:

Fig. 1 is a side elevation of a completed knife made in accordance with the present invention.

Fig. 2 is a plan view of the knife shown in Fig. 1.

Fig. 3 is a view in longitudinal section of the knife shown in Fig. 1.

Figs. 4, 5 and 6 are views taken in section on the lines 4—4, 5—5 and 6—6, respectively, in Fig. 1.

Fig. 7 is a view on a reduced scale showing in plan the knives and interconnecting sprues as they appear in actual practice when molded.

Like parts are identified by the same reference characters throughout the several views.

The general design of the blade and handle is preferably in accordance with the disclosure of the Patent No. 2,124,615 granted to Wallie Foltz on or about July 26, 1938. The blade 8 has a blunt point 9 and a blunt back 10. It is pro-

vided with a sharp cutting edge at 11 and with an anchorage portion 12. The handle 15 has one smoothly rounded face at 16 adapted to engage the palm of the user's hand. The top edge portion 17 of the handle and the opposite face 18 about which the fingers of the user extend are formed to provide substantial ridges at 19, 20, 21 and 22 in accordance with the disclosure of the aforesaid patent. Between these ridges are concave surfaces into which the user's fingers are received. That portion of the handle lying between the ridge 19 and the back 10 of the blade is extended along the back of the blade at 24 to bring the user's fingers into intimate proximity to the blade to facilitate the manipulation thereof.

The handle 15 is provided interiorly with a hollow at 25 adapted to receive a strip or sheet of material 26 upon which advertising or other matter may be printed or lettered to be visible through the flat surface 16 of the handle if the handle is made of a transparent plastic material. The end of the opening 25 in the handle is sealed by a closure 27 having a form complementary to that of the handle and made with a plug portion 28 fitted to the aperture. In practice, it is held in place by a cement made by dissolving cellulose acetate in acetone to provide a permanent seal. The hollow handle serves as a float entirely adequate to carry the weight of the blade while, at the same time, it lightens the weight of the handle to provide a better balance therefor and to facilitate the manufacture of the handle by injection molding. The pattern or die which forms the aperture 25 carries a projection (not shown) extending into the notch 29 in the end of the blade as a means of positioning the blade during the molding operation. While the projecting lug on the pattern or die does not appear, its form is clearly indicated in Fig. 3.

The blade shank or anchorage portion 12 has holes punched therein at 30 and 31. Between these holes at opposite sides of the anchorage portion of the blade, are the notches 32 and 33. The combined area of the holes 30 and 31 and the notches 32 and 33 is preferably approximately 50% of the total area of that portion of the blade which is embedded into the handle.

It is very important to note that when the handle material has flowed into the notches and apertures 30, 31, 32 and 33, it provides keys which are partially within the metal of the blade and which partially engage the metal of the blade from the outside. It is because of this arrangement that the blade may be anchored firmly by

an injection molding process involving hot material. It is because of this arrangement, moreover, that the blade will not become loosened in the handle when exposed to abrupt changes in temperature such as occur when a paring knife of this type is immersed in very hot water. The coefficient of expansion of the metal blade is naturally less than the coefficient of the handle. Under any circumstances in which the handle shrinks, with respect to the blade, the blade may tend to become loosened from those portions of the handle stock which are engaged in notches 32 and 33, but it will tighten its grip upon those portions of the handle stock which have flowed into the apertures 30 and 31. Conversely, if the blade expands with respect to the handle, it will loosen its engagement upon those portions of the handle stock which have flowed into apertures 30 and 31 but it will become all the more tightly engaged with those portions of the handle stock which are keyed into the notches 32 and 33. Thus, regardless of temperature changes, the rigidity and permanence of the connection between the blade and the handle is maintained.

In actual practice, we prefer to make the knife assemblies in pairs by automatic injection molding of hot plastic in the manner shown in Fig. 7, the two handles 15 and the two end closures 27 being molded simultaneously and connected by sprues at 35.

We claim:

1. A knife comprising the combination with a blade having a shank portion provided with a terminal opening, of a handle having an interior hollow with which said opening communicates, said handle being in molded unitary connection with the shank portion of the blade.

2. A method of making a knife which comprises the notching of the tang end of a blade, the positioning of the blade by interengagement of the notched tang and with a core, the molding of a handle about the tang end portion of the blade and about the notched end thereof and about the core inter-engaged therewith, and the withdrawal of the core to leave a hollow in the molded handle.

3. A method of making a knife which comprises the notching of the tang end of a blade, the positioning of the blade by inter-engagement

ment of the notched tang end with a core, the molding of a handle about the tang end portion of the blade and about the notched end thereof and about the core inter-engaged therewith, and the withdrawal of the core to leave a hollow in the molded handle opening at the end of the handle, and the plugging of said hollow.

4. A knife comprising the combination with a blade having a cutting portion and a tang portion of uniform thickness of stock throughout, of a handle molded upon the tang portion of the blade, the tang portion having apertures through the intermediate sides at points spaced longitudinally thereof and having notches in its opposite margins between said apertures, the combined area of such apertures and notches being approximately equal to the remaining area of that tang portion which is embedded in the handle, and the handle having integrally molded key portions interlockingly engaged in the apertures and notches of the tang portion embedded therein.

5. A knife comprising in combination a blade having a cutting portion and a tang portion of sheet metal stock, the tang portion having longitudinally spaced apertures intermediate its side margins and being provided with notches in mutually staggered relationship in opposite side margins of said tang portions between the apertures therein and having another notch in its end, a handle molded upon the tang portion of the blade and provided with a cavity opening away from the tang portion of the blade and in which the notch at the end of the blade tang is exposed, said handle having integral portions molded into keying relationship to the apertures and the side marginal notches of the blade tang, the combined area of such apertures and side marginal notches being approximately equal to the remaining area of the tang portion embedded in the handle.

6. The knife set forth in claim 4 in which the handle is provided with a closure hermetically sealing its cavity, the size of the cavity being so related to the weight of the blade and handle that said cavity is adapted to buoy up the knife in water.

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