

Dec. 7, 1943.

W. G. MITCHELL

2,335,872

CUTLERY AND METHOD OF MAKING THE SAME

Filed July 27, 1940

Fig. 1.

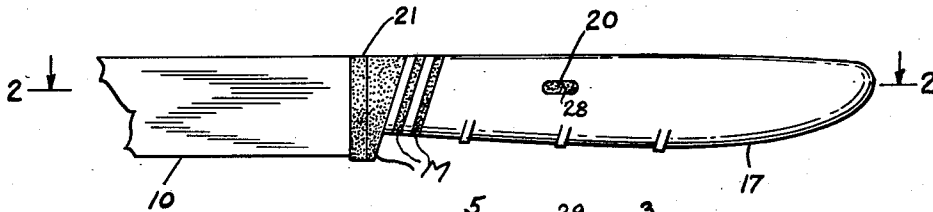


Fig. 2.

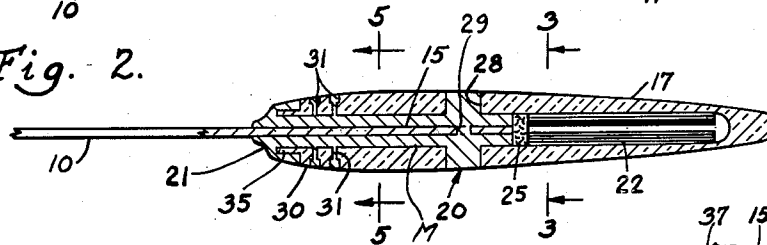


Fig. 5.

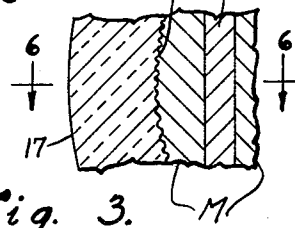


Fig. 3.

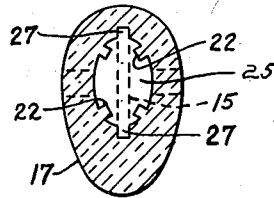


Fig. 6.

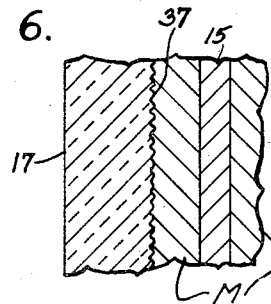
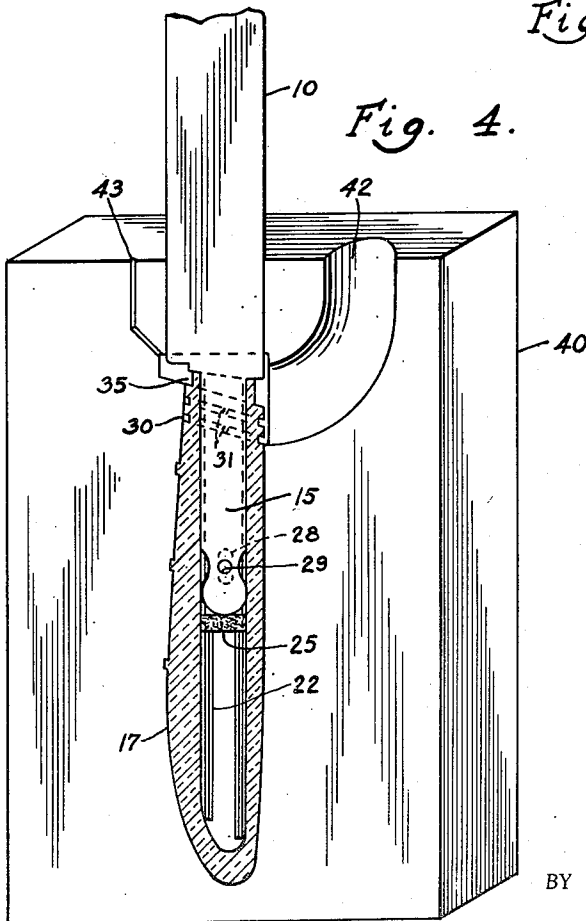


Fig. 4.



Walter G. Mitchell

INVENTOR.

BY *Frank H. Marks,*

ATTORNEY.

UNITED STATES PATENT OFFICE

2,335,872

CUTLERY AND METHOD OF MAKING
THE SAMEWalter G. Mitchell, Oak Park, Ill., assignor to
Sears, Roebuck and Co., Chicago, Ill., a corpo-
ration of New York

Application July 27, 1940, Serial No. 347,958

8 Claims. (Cl. 30—343)

My invention relates to articles of cutlery including but not restricted to knives, forks, spoons, spatulas, etc., and is especially concerned with improvements in means of securing the tang and working portion of the implement to the handle, where the handle is of a plastic material.

One of the problems in the manufacture of cutlery having nonmetallic handles has always been that of securing the tang to the handle in such a way that a firm and secure connection may be effected and one which will remain so for a long time, regardless of the changes produced by use and frequent washing. Washing subjects an implement to rather severe changes in temperature. For instance, it may be plunged into water at or near the boiling point and subsequently rinsed in cold water. The marked expansion and contraction produced by these temperature changes, because of different coefficients of expansion of the tang, handle and binding material therebetween, result in severe strains where the tang is connected to the handle, and breakage is frequently caused in this manner, producing openings accessible to filth.

An object of my invention is to produce an article of cutlery of the type referred to which will effectively solve this problem, so that the tang and handle will be firmly bound together at all times, regardless of the most severe conditions of use, always remaining highly sanitary.

Still another object is to provide such an article which will be neat and attractive in appearance, will be long wearing, simple and inexpensive to manufacture and which, in general, will be entirely satisfactory for the purposes desired.

Another object is to provide an especially economical and convenient method for producing cutlery of the type referred to.

Various other objects and advantages may suggest themselves to those skilled in the art as the description proceeds.

Referring now to the drawing forming a part of this specification:

Fig. 1 is a plan view of an article of cutlery embodying my invention;

Fig. 2 is a sectional view taken substantially along the line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken substantially along the line 3—3 of Fig. 2;

Fig. 4 is a view partly in elevation and partly in section showing such an article of cutlery positioned in a mold in process of being produced in accordance with my invention; and

Figs. 5 and 6 are fragmentary sectional views on an enlarged scale taken substantially along the lines 5—5 and 6—6 of Figs. 2 and 5, respectively.

The numeral 10 represents the working or blade portion of an implement of cutlery which, in the embodiment shown, happens to be a knife, but, as stated above, may be any other kind of

implement. Integrally connected to the blade portion 10 is a tang or connecting portion 15. The tang and blade are united to a handle 17 by flowed-in bonding material M.

5 The handle is preferably formed of a plastic material. I preferably use an aceto-butyrate, but, obviously, I can mold the handle from numerous other synthetic materials, such as phenol-aldehyde resins, also cellulose esters, etc.
10 The principal requirements of the handle material are: (1) That it be readily moldable; (2) that it will not char or burn at the flowing temperature of the bonding material; (3) that it will not distort or crack under the varying tempera-
15 tures encountered in the process of pouring the bonding material, since said material contacts only a portion of the bore of the handle; and (4) that it will have a coefficient of expansion not sufficiently different from that of the bond-
20 ing material to produce cracks or separation between the materials under temperature variations.

The handle is molded in any desired shape to suit convenience and esthetic taste and is hollow, the inner wall thereof being provided with a
25 plurality of longitudinal ribs 22 which begin at a point intermediate the length of the handle and adjacent the end of the tang 15. These ribs provide abutments to support a disc 25 which may
30 be formed of cardboard or other suitable material. Obviously, the ribs 22 may be of any desired length, so long as they are of sufficient size and strength to accomplish the functions which will hereinafter appear, and may be mere abutments
35 projecting inwardly from the inner wall of the handle. However, the ribs, as shown, may be molded very conveniently.

The bore of the handle is also provided with opposite longitudinally extending grooves 27
40 which serve as a seat for positioning the tang. The grooves 27, although required only for a portion of the length of the handle as a seat for the tang, may extend the full length thereof for convenience in molding.

45 The handle is also provided with a pair of opposed perforations 28 of substantial size to permit bonding material to flow therethrough and form the rivets 20, the tang being perforated as at 29 for the same purpose.

50 The handle is also provided on the outside thereof with a plurality of grooves 30 which preferably extend entirely around the handle. These grooves may, if desired, communicate with the interior of the handle through one or more ducts
55 31, and serve to strengthen the union between the handle and tang.

The handle is recessed adjacent the blade end thereof, as seen at 35, to accommodate the bolster 21 which may be of usual form.

My preferred method of producing the article

of cutlery described above is as follows. The disc 25 is shoved into the handle until it rests on top of the abutments 22 and the blade is then inserted in the handle with the end of the tang adjacent the disc 25. The blade and handle assembly are then placed in a two-piece mold, one member of which is indicated at 40 (Fig. 4), the mold having a gate 42 and a vent 43. This mold is preferably of steel or other suitable metal. Metal for uniting the tang and handle is then poured through the gate 42. This metal is preferably an alloy of tin 55-60%, lead 40-45%, with a small quantity of antimony, and having a pouring temperature not substantially in excess of about 400°-450° F. The metal flows around the blade and handle, as seen in Fig. 4, flowing down from the bolster into the bore of the handle, filling the bore around the tang and flowing out of the bore through the apertures 28 to form the rivets 20.

These rivets may be omitted if desired, because it is found that a firm union between the handle and bonding material is produced by reason of the fact that the inside of the handle begins to flow in small spaced areas when the hot bonding material is flowed therein, forming a multiplicity of pits and teeth 37 connecting the handle and bonding material, as seen in Figs. 5 and 6, since the handle material will soften at or below the flowing temperature of the bonding material.

The disc 25 serves not only as a guide to limit the extent of insertion of the tang, but also serves as a dam to stop the flow of bonding metal. The results of thus limiting the flow of metal are economy of metal and also lightness of weight and proper balance. Reduction in quantity of bonding metal facilitates rapid cooling because of the relatively low quantity of total heat to be dissipated, thus reducing the likelihood of excessive softening of the handle.

The heat is rapidly dissipated from the bonding material by the blade of the implement and also by the rivets' contact with the mold, thus further reducing the likelihood of softening of the handle.

Other bonding material besides metal may be used, such as a suitable synthetic thermoplastic resin or the like. Thus, for example, the bonding material may be similar in chemical and physical characteristics to the handle. At any rate, the bonding material should have a melting point which is not sufficiently higher than that of the handle that it will cause the handle to char or to flow, except to the extent indicated above.

Various modifications may suggest themselves to those skilled in the art without departing from the spirit of my invention and, hence, I do not wish to be restricted to the specific form shown or uses mentioned, except to the extent indicated in the appended claims.

I am aware that it is old to produce cutlery wherein the tang is secured to the handle by a bonding material poured at an elevated temperature, as shown in Fisher, No. 27,790 of April 10, 1860; Cady, No. 204,002 of May 21, 1878; Chapman, No. 106,323 of August 16, 1870; Woods, No. 82,779 of October 6, 1868; and Smith, No. 1,055,091 of March 4, 1913.

I claim:

1. An article of cutlery comprising a hollow handle, a tool having a tang disposed in said handle, retaining means formed on the inner wall of said handle, a disc engaging said retaining means a substantial distance from the free end of said handle adjacent said tang, and means bonding the tang to the handle consisting of ma-

terial flowed therebetween, said bonding material extending only to said disc.

2. An article of cutlery comprising a hollow plastic handle, a tang of a tool disposed in said handle, and a suitable thermo-fluid bonding material disposed between the tang and handle, the inner wall of said handle and the bonding material being interlocked by reason of the interflowing of the materials of said handle and bonding material and subsequent congelation thereof.

3. An article of cutlery comprising a hollow plastic handle, a tang of a tool disposed in said handle, and a suitable thermo-fluid bonding material disposed between the tang and handle, the flowing temperature of the bonding material being sufficiently high to cause the inner surface of the handle to flow when the molten bonding material contacts the handle while being insufficiently high to cause the handle to char.

4. An article of cutlery comprising a hollow plastic handle, a tang of a tool disposed in said handle, and a thermo-fluid bonding material disposed between the tang and handle, the flowing temperature of the bonding material being sufficiently high to cause the inner surface of the handle to flow when the molten bonding material contacts the handle while being insufficiently high to cause the handle to char, the bonding material terminating a substantial distance from the free end of the handle.

5. An article of cutlery comprising a hollow plastic handle, a substantially smooth surfaced tang of a tool disposed in said handle, and a suitable thermo-fluid bonding material disposed between the tang and the handle, the flowing temperature of the bonding material being sufficiently high to cause the inner surface of the handle to flow when the molten bonding material contacts the handle while being insufficiently high to char or melt more than a limited inner portion of the handle whereby the bonding material will form an intimate union with the handle.

6. An article of cutlery comprising a hollow plastic handle, a substantially smooth surfaced tang of a tool disposed in said handle, and a suitable bonding material consisting of a metallic alloy disposed between the tang and the handle, the flowing temperature of the bonding material being sufficiently high to cause the inner surface of the handle to flow when the molten bonding material contacts the handle while being insufficiently high to char or melt more than a limited inner portion of the handle whereby the bonding material will form an intimate union with the handle.

7. A method of producing an article of cutlery comprising positioning in a hollow plastic handle a substantially smooth tang of a tool, and flowing between the tang and the handle a suitable metallic alloy heated to about its melting point, said melting point being sufficiently high to soften to a slight degree a limited inner portion of the handle but not sufficiently high to char or melt more than said limited portion thereof, whereby a close interlocking union is formed between the alloy and the handle.

8. An article of cutlery comprising a hollow handle, a disc disposed in said handle intermediate the ends thereof, a tool having a tang disposed in said handle adjacent said disc, and bonding material flowed between and bonding the tang to the handle, said bonding material extending only to said disc.

WALTER G. MITCHELL.