A method of making cutlery articles, especially spoons, forks, and cake servers, of semi-finished sheet metal material, according to which form a web of sheet metal there is punched out a plurality of relatively narrow cutouts extending transversely to the longitudinal direction of said web and one behind the other in the longitudinal direction of the web while each of said cutouts is closed at least at one end thereof with said closed end in spaced relationship to the adjacent side edge of said web, whereupon the thus prepared sheet metal web is rolled so as to widen the width of said cutouts, and cutlery blanks in conformity with the article to be made are punched out of said web.

2 Claims, 13 Drawing Figures
METHOD OF ROLLING CUTLERY PIECES

The present invention relates to a method of making cutlery pieces, such as spoons, forks, cake servers, or the like, from semi-finished sheet metal material by means of a rolling mechanism of various types. According to methods of this type employed for making individual cutlery pieces, it has heretofore been customary first to produce flat blanks in a plurality of working steps and subsequently to shape these blanks to their final configuration, for instance, to the shape of spoons.

It is further known in a so-called synchronous system to punch out the individual preforms, to trim the same and finally manually to guide them through a rolling mechanism in order to preroll the same on both sides. In such an instance, primarily slow moving duo rolling mills are employed. The finish rolling is effected by a plurality of passes on additional rolling mills while the pieces are likewise guided manually.

With the above described semi-manual methods, it is particularly disadvantageous that the rollers during each entering operation will slip briefly on the sheet metal which fact may result in local cold welding between roller surface and work piece surface. The surface (rolling grooves) created in this manner have to be eliminated, for instance, by additional grinding and polishing. Undesired punching losses may occur due to the fact that when the frame of the rolling mill springs due to the shock inherent to the entering of the work piece, marks will be produced at the marginal areas of the preform or the blank.

It is, therefore, an object of the present invention to provide an improved manufacturing process for making cutlery pieces, such as spoons, forks, cake servers, and the like, from semi-finished sheet metal material, while assuring a final product which will have a uniform quality throughout.

This object and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which:

FIGS. 1, 2, 2a and 3 respectively illustrate individual preforms at different phases of the manufacturing process.

FIGS. 4 and 4a respectively illustrate in top view and end view a multi-preform in raw or unfinished condition.

FIGS. 5 and 5a respectively illustrate a top view and an end view of a preform according to FIGS. 4 and 4a after the rolling operation.

FIGS. 6 and 6a illustrate a modified multi-preform in top view and end view respectively.

FIGS. 7 and 7a show the multi-preform of FIGS. 6 and 6a after the rolling operation.

FIG. 8 shows a top view of a preform sheet comprising a plurality of preforms.

The method of making cutlery pieces from semi-finished sheet metal material according to the present invention is characterized primarily in that the bands or webs of sheet metal from which the cutlery blanks are to be produced extend in considerable length in the rolling direction and are designed as prepuncheled multi-preforms permitting a continuous manufacturing process.

The preform may have a unilateral or a bilateral shape. One of the conditions of the method according to the present invention consists in that the multi-preform is provided with transversely extending punched out portions located between metal sheet bars which will form, for instance, the spoon handles. The cutlery blanks may be punched out unilaterally or bilaterally from the multi-preform.

According to a particularly favorable method, two or more multi-preforms for a rolling on a plurality of sides may be arranged adjacent to each other and, more specifically, in a direction transverse to the rolling direction. It is, of course, understood that the maximum width of the metal sheet is determined by the width of the roller body. Moreover, the sheet may, in conformity with the width of the individual multi-preforms be subdivided into strips for processing in customary separating devices.

An important contribution to economizing the method according to the present invention consists in that the band-shaped multi-preforms may prior to and after the rolling operation be wound onto drum or sleeves by means of corresponding winding devices. In view of the punched out areas, disorders may occur, particularly with small radii of the collars of the blank. Thus, for instance, the bands which are not smooth may during the winding up operation hook into each other. In order to avoid any such disorders caused in this way, in conformity with the present invention, a smooth band is wound up together with the forms in order to separate the preform layers from each other.

For carrying out the method according to the present invention, rolling mills of the duo, quarto or multi roller type for one-way, reversing and tandem operation of standard type may be employed and their rollers may be profiled in conformity with the cross sections of the respective multi-preforms.

Referring now to the drawings in detail, the conventional manufacture of individual cutlery pieces starts with the punching out and the deburring of a preform 1 which after multi pass rolling through a second intermediate stage 1a eventually results in a punched out cutlery piece 1b. In order to obtain a marketable product, the flat scotching portion 1c has to be hollow pressed and the handle 1d has to be bent.

According to a method according to the present invention, illustrated in FIGS. 4 and 4a for a spoon, a comb-shaped multi-preform preform 2 is by a zone rolling on the left-hand side transformed into an intermediate form 2a while in view of the linear expansion of the lateral rolling strip the non-rolled handle portions 3, 3a are automatically moved apart, which means that the punched out slots 4 will increase in width so that they will be spaced from each other by distance 4a. The punching out of the still flat preform of the spoon is effected along the dash lines of FIG. 5.

A further step in the direction of economizing the manufacture of cutlery pieces in conformity with the present invention is the employment of a bilateral or double preform 5, 5a as shown in FIGS. 6, 6a and shown in FIGS. 7, 7a in dash lines. The punched out areas 6, 6a which in this instance are closed, will confine corresponding webs 7, 7a which latter form the spoon handles. By separating the double preform along a plane of symmetry extending in the rolling direction, two rows of sets of spoons are formed which can then be further machined as has been described in connection with the strips according to FIGS. 4 and 5.
It is, of course, possible to arrange a plurality of double preforms as shown in FIGS. 6 and 7 and, more specifically, transverse to the rolling direction so that preforms 8 are obtained in conformity with FIG. 8. For dividing the preforms into double strips, any known standard separating or cutting methods may be employed.

A multi-preform will over its entire rolling length correspond not only to precise measurements but it will also assure with a minimum of waste such highly satisfactory surface condition that the usually necessary post-treatment, such as annealing, refining, and the like, will not be necessary. By a corresponding punching out of the semifinished plate prior to the start of the rolling operation, the material has the possibility of properly flowing without a change in the cross section of the cutlery piece handle during the rolling operation. The handles will merely increase their distances from each other in conformity with the degree of rolling so that, depending on the reduction, it is also possible to influence the surface of the cutlery piece. Generally, high alloyed steel as well as precious metals may be employed for making cutlery pieces of the type involved.

The continuous rolling of cutlery pieces will on the rolling mill require suitable guiding means in order to keep and hold the multi-preforms properly aligned with regard to the roller center regardless of whether unilateral, bilateral or multilateral designs of the preforms are involved. The rolling profile may be provided on both or one roller only, or with a corresponding width of the roller body, also a plurality of profiles may be provided on the rollers.

It is, of course, to be understood that the present invention is, by no means, limited to the particular method set forth above but also comprises any modifications within the scope of the appended claims.

What we claim is:

1. A method of making multi-preforms for the production of cutlery articles, especially spoons, forks, and cake servers, of semi-finished sheet metal material, which includes the steps of: partially dividing the metal web transversely to the longitudinal direction by punching cut out areas of the same width, leaving two longitudinal side edge areas of said web undivided, the middle divided area being dimensioned as to form pairs of handle blank portions of said articles to be produced between successive cut out areas, rolling said undivided edge areas to a reduced thickness so as to widen the spacing between said handle blank portions, each pair of articles being formed from each pair of handle blank portions and opposite portions of said side edge areas, the article portions formed from said side edge areas being divided along lines through said cut out areas.

2. A method according to claim 1 with a web of sheet material having a continuous integral strip extending in the longitudinal direction of said web and located on each side of said slots, which includes the step of dividing each of the transverse sections remaining between each successive cut out areas along the length of said sections into substantially two halves to respectively form a pair of handles for each two spoons to be made, and respectively punching out from both strips the scooping portions of the spoons respectively pertaining to each pair of handles.

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