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PROCESS OF FORMING UTENSILS

Filed May 25, 1928

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

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The invention relates to aluminum cooking utensils and particularly to an improved process for forming a cooking utensil having a thick bottom wall and relatively thin side walls produced by successive drawing and spinning of the metal.

In recent years the cooking of foods without water has come into vogue and so-called waterless cookers have come into popular use. Such cookers ordinarily comprise a cooking vessel having a substantially steam-tight cover and adapted to be placed upon a base located over a burner or fire, this base being provided to protect the substantially thin bottom wall of the cooking utensil and prevent the same from overheating.

The process to which the present invention pertains is especially adapted for the manufacture of cooking utensils for this waterless cooking, providing for the formation of a vessel having a thick bottom wall with comparatively thin side walls, thus eliminating the necessity of using an extra base to protect the bottom wall of the vessel from the flame or fire.

The object of the improvement is to provide a process by means of which an aluminum sheet or plate of heavy gauge may, by successive drawing and spinning operations, be shaped into a cooking utensil having a thick bottom wall of substantially the same gauge as the original sheet blank while the side walls are spun down to comparative thinness, thus providing for the greater weight of the material only at the point where the same is required without unnecessarily increasing the weight of the utensil.

The various steps of the improved process are illustrated in the accompanying drawing, in which

Figure 1 is an edge view of the initial sheet blank from which the utensil may be formed;
Fig. 2, a vertical sectional view through the partly formed product after the drawing operation;
Fig. 3, a similar view showing the partly formed product after the first spinning operation;
Fig. 4, a similar view after the second spinning operation;
Fig. 5, a view similar to Fig. 4 after the final spinning and polishing operation;
Fig. 6, a vertical sectional view through the completed utensil; and
Fig. 7, a view similar to Fig. 6, showing a slightly modified form of cooking utensil which may be produced by substantially the same process.

Similar numerals refer to similar parts throughout the drawings.

In carrying out the improved process a sheet blank of proper size and of say eight gauge aluminum as shown at 1 in Fig. 1 may be first drawn or formed as shown in Fig. 2 to produce the shallow dish-like partly completed product 2 having the bottom wall 3 and side wall or peripheral flange 4 both of substantially the same thickness as the original sheet blank 1.

By a spinning operation the side walls 4 are then elongated and reduced in thickness, producing the product shown in Fig. 3. This spinning operation may best be accomplished upon a "Bliss" automatic machine, the side wall of the utensil being spun by means of a roller wheel, the carriage of the machine being preferably operated by hand.

The bottom wall 3 remains of the same thickness and the side wall as shown at 5 is considerably elongated and reduced in thickness. This spinning operation leaves a substantially rough surface upon the exterior of the side walls as indicated at 6.

In order to remove the rough appearance of the outer surface of the side walls, a second spinning operation is carried out. This operation, it has been found by experience, is best performed on an engine lathe, a roller wheel carried by the gear driven carriage of the lathe being used for spinning the metal.

This wheel operating upon the exterior of the side walls of the product practically eliminates all of the rough surface, producing the product shown in Fig. 4, the side walls 6 having the substantially smooth outer surface which, however, may show small peripheral gauge rings or grooves as indicated at 7.

The bottom wall 3 still remains the same thickness as the original sheet blank.

If it is desired to remove these gauge rings...
or grooves, the product as shown in Fig. 4 may be again placed upon a Bliss automatic machine and spun by means of a shoe, removing the last vestige of these gauge rings or grooves and producing a smooth outer surface upon the side wall 6 as illustrated in Fig. 5.

To produce the finished receptacle shown in Fig. 6, the free open upper edge of the side walls may then be trimmed and a bead 8 formed thereon in the usual manner.

Instead of forming the bead as shown in Fig. 6, a solid rim edge 9 may be formed upon the utensil as shown in Fig. 7, this being accomplished by spinning the partially completed product as shown in Fig. 2 from the bottom to a point slightly spaced from the top edge of the thick side wall 4, leaving sufficient stock at the edge to permit formation of this rim 9.

From the above it will be seen that an efficient and practical process is provided for forming a one-piece utensil having a bottom wall of any desired thickness, and reduced side wall which may be as shown in the drawing of approximately twenty gauge thickness while the bottom wall may remain substantially eight gauge in thickness.

It should be understood, of course, that either heavier or lighter than eight gauge material may be used and the side walls may be spun to greater or less than twenty gauge thickness depending entirely upon the use to which the utensil is to be placed.

Although it has been above stated that the process is especially adapted for producing cooking utensils of the so-called waterless cooker type, it should be understood that any other form of cooking utensil may be produced by this process, it being desirable in most cases to provide a bottom wall of greater thickness than the side walls, the utensil being thus strengthened and reinforced at the point where it contacts with the flame or fire while the side walls may be thinner to decrease the weight.

We claim:

1. The process of forming a utensil from a sheet blank, which consists in drawing the edge portions of the blank to produce a dish-like product having bottom and side walls of substantially the original thickness of the blank, then roller spinning the side wall to elongate the same and reduce the thickness thereof.

2. The process of forming a utensil from a sheet blank, which consists in drawing the edge portions of the blank to produce a dish-like product having bottom and side walls of substantially the original thickness of the blank, then roller spinning the side wall to elongate the same and reduce the thickness thereof and then further roller spinning the side wall to smooth the surface thereof.

3. The process of forming a utensil from a sheet blank, which consists in drawing the edge portions of the blank to produce a dish-like product having bottom and side walls of substantially the original thickness of the blank, then roller spinning the side wall to elongate the same and reduce the thickness thereof, and then forming a bead at the free edge of the side wall.

4. The process of forming a utensil from a sheet blank, which consists in drawing the edge portions of the blank to produce a dish-like product having bottom and side walls of substantially the original thickness of the blank, then roller spinning the side wall to elongate the same and reduce the thickness thereof, then further roller spinning the side wall to smooth the surface thereof, and then forming a bead at the free edge of the side wall.

5. The process of forming a utensil from a sheet blank, which consists in drawing the edge portions of the blank to produce a dish-like product having bottom and side walls of substantially the original thickness of the blank, then roller spinning the side wall to elongate the same and reduce the thickness thereof, then shoe spinning the side wall to completely smooth the surface thereof.

6. The process of forming a utensil from a sheet blank, which consists in drawing the edge portions of the blank to produce a dish-like product having bottom and side walls of substantially the original thickness of the blank, then roller spinning the side wall to elongate the same and reduce the thickness thereof, then further roller spinning the side wall to partially smooth the surface thereof, and then shoe spinning the side wall to completely smooth the surface thereof.

7. The process of forming a utensil from a sheet blank, which consists in drawing the edge portions of the blank to produce a dish-like product having bottom and side walls of substantially the original thickness of the blank, then roller spinning the side wall to elongate the same and reduce the thickness thereof, then further roller spinning the side wall to partially smooth the surface thereof, then shoe spinning the side wall to completely smooth the surface thereof and then forming a bead at the free edge of the side wall.

In testimony that we claim the above, we have hereunto subscribed our names.

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