

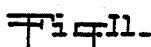
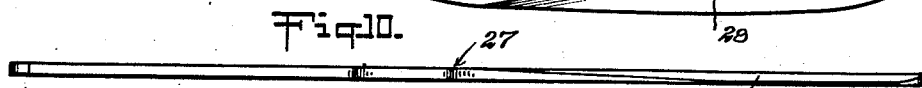
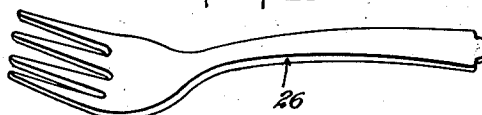
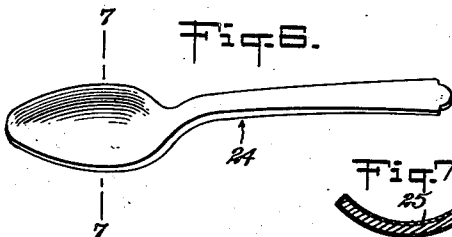
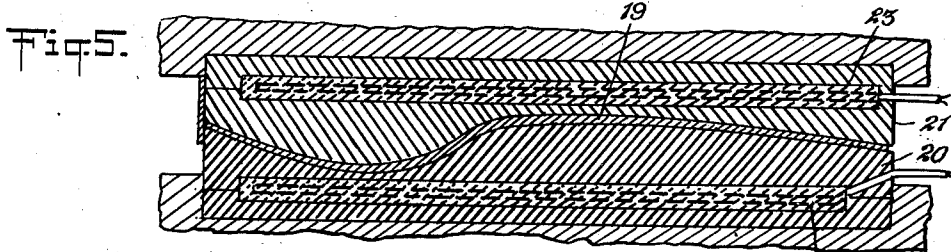
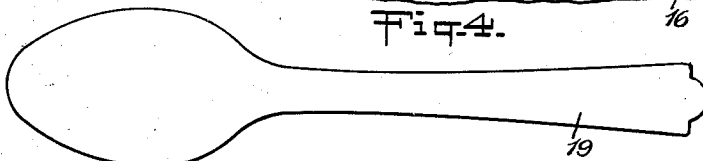
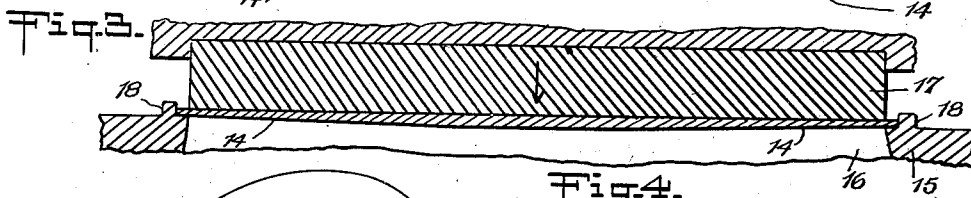
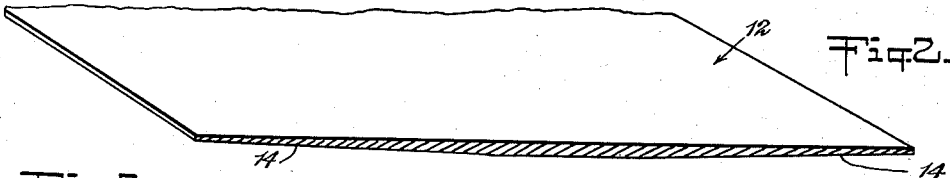
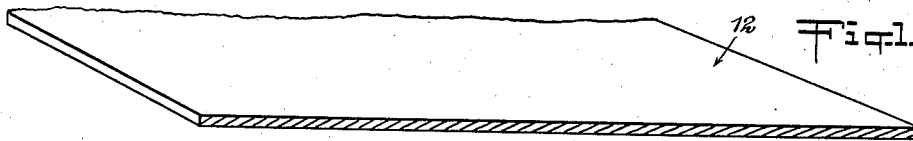
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2,398,326

PROCESS OF MAKING ARTICLES FROM FIBROUS MATERIAL

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PROCESS OF MAKING ARTICLES FROM FIBROUS MATERIAL

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1 Claim. (Cl. 18—56)

This invention relates to an improved process for making articles from wood fibre in pressed sheet form.

It is an object of the invention to provide an improved process whereby an article which is relatively strong and durable can be produced at a comparatively nominal cost.

In carrying out my process I contemplate manufacturing my new product from sheet material made from ground or finely divided wood fibre, tightly pressed under high pressure and usually held together by means of a suitable binder. Pressed wood fibre sheets of this type are commercially available at the present time, and are identified by various trade-marks and trade names such as "Masonite" and "Weatherwood." This material is very hard, tough and durable and is extremely difficult to "work." At the present time it is employed principally in the building industry.

I have found that by means of the improved process described herein, I am able to fabricate the pressed wood fibre sheet material into various articles which are hard and durable and which will withstand the action of heat and of various solvents, such as water, alcohol, grease and the like. Among the articles to which my invention is particularly adapted are eating utensils such as knives, forks and spoons, although it should be understood that plates, cups and other articles may also be manufactured from this material.

The utensils such as knives, forks and spoons, which are made by means of my process, are very inexpensive, and accordingly can be used but once or twice and then disposed of. For this reason they are particularly adapted to be used for picnics and also wherever sanitary requirements make it necessary or desirable to dispose of utensils after they have been used. However, it should be understood that because of the durable and strong nature of the material used in fabricating the utensils, they may be used repeatedly over a long period of time if desired.

In the accompanying drawing—

Fig. 1 is a fragmentary perspective view of pressed wood fibre sheet material of the type which may be used in carrying out my invention;

Fig. 2 is a similar view showing the edges thereof skived or beveled;

Fig. 3 is a longitudinal sectional view of a cutting die which may be used for cutting the sheet material into blanks of the desired size and shape;

Fig. 4 is a top plan view of a blank cut from

the die and from which a spoon may be fabricated;

Fig. 5 is a longitudinal sectional view through a heated die which may be used in molding and shaping the blank to the desired form of the finished article;

Fig. 6 is a perspective view of a spoon embodying my invention and made in accordance with my improved process;

Fig. 7 is a sectional view of the spoon on the line 7—7 of Fig. 6;

Fig. 8 is a perspective view of a fork embodying my invention and made in accordance with my improved process; and

Figs. 9, 10 and 11 are top plan, side elevational and cross sectional views, respectively, of a knife embodying my invention and made in accordance with my improved process.

As previously stated, I fabricate the articles in accordance with my present invention from pressed wood fibre sheet material. Such material is made from ground or finely divided wood fibre, pressed together under very high pressure so that the wood fibres are very compact and the finished sheet is extremely hard. I have found that sheet materials of this type, available under the trade names "Masonite" which is made from exploded wood fibers and "Weatherwood" are very satisfactory for the purpose of the present invention.

In Fig. 1 I have shown a sheet of this material, identified by the numeral 12. The length of the sheet may vary considerably. However, I have found that for economical manufacture it should preferably be long enough to permit the cutting of a plurality of blanks therefrom, in the manner hereinafter described. The width of the sheet should preferably be slightly greater than the length of the article or utensil to be made therefrom. I have illustrated my process in the accompanying drawing in connection with the fabrication of a spoon, and accordingly, the width of the sheet from side to side, as viewed in Fig. 1, should be slightly greater than the length of the spoon blank, illustrated in Fig. 4. I have found that, for the manufacture of spoons and similar utensils, sheet material approximately one-eighth of an inch thick is very satisfactory.

In the fabrication of an article requiring molding or shaping near the ends thereof, such as a spoon or fork, I have found that it is desirable to skive or bevel the sheet material from a point adjacent the center, towards the two side edges thereof, in the manner shown at 14 in Fig. 2. This may be accomplished by means of a planing

or cutting operation in the usual manner. The beveling or skiving of the material towards the two edges produces several results. Thus it facilitates the subsequent stamping and molding operations, it imparts a finished appearance to the article, and provides an article in which the central portion is somewhat stronger than the two ends. It will be appreciated that in utensils, such as a spoon or fork, the central portion is subjected to the greatest strain, and accordingly, my process results in a structural advantage.

After the edges of the sheet material have been beveled or skived in this fashion, I subject the sheet material to a softening operation so as to permit it to be cut in a cutting die. I have found that the material can be satisfactorily softened by placing it in water and permitting it to soak until the desired softness has been obtained. I have found that very satisfactory results are obtained by permitting the sheet material to soak in cold water for approximately 24 hours, although this period of time may be considerably varied.

After the sheet material has been softened in this fashion, the next step is to form blanks of the desired shape, by cutting the sheet material in a cutting die. The blanks which are thus formed or cut from the sheet material should have the desired outline of the finished article so that they can thereafter be shaped and formed in a mold, as hereinafter described, without any further cutting.

In Fig. 3, I have illustrated a cutting die of the type which may be used in forming the blanks, consisting of a female die element 15, having a cavity 16, having the same contour as the blank which it is desired to cut therefrom, and a male die element 17, of a size and shape to tightly fit into the die cavity 16. The die elements are placed in the usual type of die cutting machine, and the female die element remains stationary, and the male die element is caused to reciprocate. The skived and softened sheet material is placed on top of the female die element which is preferably provided with guides 18, to insure proper positioning of the sheet material. When the sheet material is positioned so as to cover the die cavity, the male die element is caused to reciprocate, with the result that the blank 19 is cut from the material. After each successive blank is cut, the sheet material is shifted longitudinally along the female die element a sufficient distance so as to permit a new blank to be cut therefrom.

It should be appreciated that the shape of the die will vary with the shape of the blank which it is desired to cut. In the present instance it is desired to cut a blank for a spoon, and accordingly the die is formed so as to provide a relatively large head, as shown, for the bowl of the spoon, and a handle portion having an ornamental and attractive contour.

After the blank is formed, the next operation is to shape the blank and impart thereto the desired curvature. I have found that this can be accomplished by softening the material in the blank and then shaping it in a shaping mold and causing it to set in the shape imparted thereto by the mold. I have found that the molded article should be caused to set relatively rapidly, and to obtain this result, I soften the blank by subjecting it to hot steam until it becomes saturated therewith. I then place it in a heated mold of the type shown in Fig. 5, which simultaneously shapes the blank and imparts thereto the desired curvature, and also causes the steam to evaporate,

with the result that the article sets or rigidifies in its molded form.

The mold consists of male and female elements 21 and 20, respectively, heated by the electric heating elements 22 and 23. The female mold element 20 has a cavity therein having the shape and curvature of the desired finished product, and the male element is of complementary shape and size so that it can project into the cavity. The mold elements are placed in a press and can be moved towards and away from each other. In using the mold it is first heated by means of the electric heating elements, the steamed and softened blank is then placed in the cavity of the female mold, and the male mold is pressed downwardly over and into the cavity, with the result that the blank is formed and curved, in the manner shown, to the desired curvature of the finished article. The heat of the die element causes the steam to evaporate, with the result that the wood fibre material sets or rigidifies in the molded shape.

It will be appreciated that the size and shape of the mold will vary with the size and shape of the article that it is desired to form. In the present instance it is desired to form a spoon, and accordingly the mold is formed to impart transverse and longitudinal curvature to the bowl portion, producing a bowl having a concave upper surface and to impart longitudinal curvature to the handle portion, producing the usual type of bridged handle. A finished spoon embodying my invention is indicated by the numeral 24 in Fig. 6, and the curvature of the spoon is clearly shown in this figure.

After the spoon has been molded and it has rigidified or set in its molded shape, the next operation is to remove therefrom any rough or projecting edges resulting from the die cutting operation. I have found that this can be easily accomplished by means of a tumbling operation. A plurality of the molded spoons are placed in a tumbling chamber which is revolved. Suitable tumbling agents, such as shot, marbles, pebbles or the like, may also be placed in the tumbling chamber. However, it should be understood that the molded spoons alone may be employed and the action of one spoon against the others will serve to smooth the edges and remove projecting particles.

After the smoothing and finishing operation, I preferably apply a coating, such as indicated at 25 in Fig. 7, to the spoon, although the spoon may be used for many purposes without the coating. The coating preferably takes the form of a lacquer which will withstand comparatively high temperatures, such as the temperatures of heated food, and which will resist the action of water, grease and alcohol. I have found that suitable lacquers for this purpose are lacquers having a plastic base, such as nitro cellulose, cellulose acetate and the like. The lacquer may be very satisfactorily applied by either dipping or spraying. After the lacquer has dried and hardened, the spoon is ready for use.

It will be appreciated, of course, that the spoon may be packaged in an attractive manner, along with other spoons or along with other utensils. The spoon which has thus been made is relatively durable, and can withstand the ordinary service to which an article of this character is subjected. At the same time, the spoon is very inexpensive and accordingly the user can dispose of it after using it one or more times, if he so

desires. However, due to the durable character of the spoon, it can be used repeatedly.

Other utensils, such as the fork 26 shown in Fig. 8, may also be made by the same operation. In making the fork shown in Fig. 8, exactly the same operations as are employed in connection with the spoon are followed. However, the cutting die and mold are of different form and shape. The cutting die is provided with portions to form the teeth in the fork, and the mold is formed so as to provide the curvature illustrated in the drawing.

In Figs. 9, 10 and 11, I have also shown a knife 27, made in accordance with my invention. In making the knife, a somewhat similar series of operations are performed. However, since the knife is not curved or shaped in the manner of the fork and spoon, it is not necessary to subject it to the molding operation, nor is it necessary to skive or bevel the edges of the sheet material, which is done primarily to facilitate and aid the molding operation. Accordingly, in making the knife, the first operation is to soften a sheet of the wood fibre material 12, shown in Fig. 1, by placing it in cold water for the desired period of time, as, for instance, 24 hours. When the sheet of material is softened, the next operation is to cut the knife blank by means of the cutting die. The knife blank should have the desired contour of the finished knife, and the cutting die should be formed accordingly. The knife blank is then subjected to a tumbling operation so as to remove the rough and projecting edges thereof, and this is accomplished in the manner previously described by placing a plurality of blanks in a tumbling chamber, either with or without the presence of additional tumbling agents, and then rotating or agitating the chamber.

After the tumbling operation, I preferably sharpen the blade of the knife by beveling or skiving the blade in the manner indicated at 28 in Figs. 9, 10 and 11, towards the cutting edge thereof. The skiving or beveling operation may be accomplished by planing or cutting in a well-known manner. After the knife has been thus formed, it is then preferably provided with a coating, in the manner described in connection with the spoon.

From the foregoing description of my invention, it will be appreciated that I have provided an improved process and product whereby a utensil or similar article can be produced at a very nominal cost. The resulting utensil or similar article will, nevertheless, have considerable strength and durability and can withstand heat and the action of many solvents.

It should be understood, of course, that modifications may be made in the illustrated and described embodiments of my invention, thus, for instance, other types of articles than those illustrated in the drawing may be made by means of my process.

I claim:

The method of making an article such as a spoon from sheet material formed of compressed wood fibre which comprises beveling the sheet material from an intermediate portion towards two opposite edges thereof, then softening the beveled sheet material so that it can be die-cut by soaking it in water, next die-cutting the softened sheet material into a blank having the outline shape of the article, then steaming the blank to make it workable, molding the blank while it is thus workable, and rigidifying the blank in its molded condition.

JOHN F. REEVES.