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ELECTROPLATED COOKING UTENSIL

Henry E. Adelsperger, Jr., and Anthony F. Cassin, Detroit, Mich., assignors to Auto City Plating Company, Inc., Detroit, Mich., a corporation of Michigan

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The invention relates to hollow ware, and the principal object of the invention is to obtain an improved type of hollow ware useful primarily for cooking purposes. It is well known that the old fashioned skillet or frying pan made of cast iron is ideally suited for cooking certain foods, but it has on the other hand certain disadvantages, one of which is that being a ferrous metal, it is quite susceptible to rusting, and another is that the general appearance of cast iron is not as pleasing as the appearance of certain other metals, such as aluminum, which are susceptible to a high degree of finish or polish.

The principal object of our invention is to provide an improved type of frying pan or other hollow ware article, utilizing cast iron but modifying the same so as to improve both its properties as a cooking utensil and also its appearance. In accordance with our invention, a cast iron frying pan is provided with an electro-plated protective coating on certain surfaces thereof. More particularly, the bottom and the outside surfaces including the handle, are provided with a protective coating while the inside surface which comes in contact with the food is unplated, and has the surface characteristics of un-treated cast iron. Thus the hollow ware of our invention has the advantage that the outer surface of the device which comes in contact with the flame or other source of heat, is of a different composition than the inner surface which comes in contact with the food being cooked.

In carrying out our invention, a cast iron frying pan is placed in a special type of plating bath which is so regulated and controlled that the electro-deposited metal forms only upon the outer surfaces and not upon the inner surfaces. The first step in the process is to electro-plate the article with a suitable nickel bath containing for example nickel sulphate up to fifty ounces per gallon; nickel chloride up to six ounces per gallon; and boric acid up to six ounces per gallon. Desirably the formula for the bath is such that the nickel sulphate ranges between twenty and forty ounces per gallon, preferably thirty, while the nickel chloride ranges from two to seven ounces per gallon, preferably five. The boric acid is preferably five ounces per gallon. The bath is preferably so regulated that the acidity is of the order of pH 1.0, or a range say from .5 to 1.5. Such an acid bath has been found to provide a nickel coating on the outer surfaces of the frying pan without plating the inside surfaces. Usually the plating is carried out at an

elevated temperature from 100 to 180° F., the preferred temperature being 165° F.

After plating with nickel and washing in the usual manner, the article is placed in a special chromium bath so regulated as to cause electro-deposition of chromium on the outer surfaces and not on the inner surfaces. As an example of a suitable bath, it is preferable to use chromic acid, together with a sulphate catalyst in the ratio of approximately sixty parts of chromic acid to one part of sulphate. When such a bath is used, the chromium is deposited on the outer surfaces to form a good coating, but no deposit is obtained on the inner surfaces.

Another chromium bath which may be used to plate the outside surfaces without depositing chromium on the inside surfaces is a modified fluo-silicate bath. For normal chromium plating operations with a fluo-silicate bath it is usual to use a ratio of forty ounces per gallon of chromic acid to two ounces per gallon of hydro-fluo-silicic acid. In carrying out our invention we use a bath having a ratio of chromic acid to hydro-fluo-silicic acid of fifty-eight ounces per gallon to eight ounces per gallon. We have found that this bath inhibits the deposition of chromium on the inside surfaces and at the same time causes a bright deposit on the outside surfaces.

From the above it will appear that in accordance with our invention we have provided hollow ware such as a frying pan, with the outer surfaces coated with a combination nickel chromium layer while the inner surfaces are unplated cast iron. Among the advantages of this construction are the following:

1. The article has a pleasing appearance because the chromium finish can be highly lustrous;
2. The outer surface is prevented to a large degree from tendency to rust;
3. The surface of the skillet coming in contact with the heat or flame is protected therefrom by the electro-plated metals;
4. The inner surface with which the food contacts has no metallic constituents which are objectionable from a therapeutic standpoint;
5. The inner surface is non-destructible. If the inner surface were plated, there would be danger that the plate might chip, peel or scratch during service, thus contaminating the food and presenting an unsightly appearance;
6. The pores on the outer or flame surfaces are closed by the electro-deposited metal, while the pores on the inner or food surface remain open;
7. The inside surface retains the porosity of

the cast metal and can be "seasoned" with grease before using;

8. The surfaces of the skillet coming in contact with the food are immune to the action of the acids in certain vegetables such as tomatoes, whereas a plated surface would be dissolved or otherwise detrimentally acted upon by such acids;

9. The inside unplated surfaces radiate heat more rapidly than the outside plated surface, which means that the heat will be delivered to the food more rapidly or for a longer period of time because of this difference in radiation surfaces. This is of particular advantage when our invention is used in connection with Dutch oven utensils or utensils used as roasters, since the outside surface will tend to insulate or improve the radiation of the inside surface. In order to still further bring out this advantage, it is sometimes desirable to coat the bottom surface only of the skillet with black or other colored paint or otherwise to treat the bottom of the utensil so as to improve the heat absorption qualities. This treatment is however provided at the flame surface only, since the other exposed surfaces are preferably maintained bright to reduce radiation.

In the preceding description we have referred particularly to a cast iron frying pan having the outer surfaces coated first with a layer of nickel and then a layer of chromium. It is preferable to have the side surfaces highly polished prior to electroplating so that a bright, shiny appearance is given after the chromium deposit. The same is true of the handle and the top edge of the frying pan. The bottom surface, however, is preferably left rough prior to plating, thus giving a relatively dull bottom surface after plating, although one having, nevertheless, the protective properties of the plated metal.

While cast iron is the preferred metal for an article made in accordance with our invention, nevertheless in the broader aspects the invention is not limited to this particular material. In some instances it may be found desirable to replace the cast iron with malleable iron or cast steel, or any other suitable metal or alloy. It is also to be understood that in certain broader aspects the invention is not limited to electroplated layers of nickel and chromium, but other electro-plated materials may be used in lieu thereof, providing they give to the finished arti-

cle the characteristic features which have been discussed above.

From the above it will be seen that our improved hollow ware is the only electro-plated cooking ware which can be seasoned, and it is the only electro-plated cooking ware having the food contacting surfaces immune from the acids of tomatoes and certain other vegetables.

What we claim as our invention is:

1. A skillet or frying pan having the body and inner cooking surface of cast iron and having the outer surface covered with electroplated chromium.

2. A skillet or frying pan having the body and inner cooking surface of cast iron and having the outer surface covered with consecutive layers of electroplated nickel and electroplated chromium.

3. A cast iron hollow ware article adapted for cooking purposes having the inner cooking surface of cast iron and having the outer surface covered with consecutive layers of electro-deposited nickel and chromium, the handle, top edge and side surfaces being buffed to give a high lustre and the bottom outside surface being relatively rough and unpolished.

4. A food cooking utensil having the body and inner cooking surface of cast iron and having the outer surface covered with an electroplated metal of the class consisting of nickel and chromium.

5. A food cooking utensil having the body and inner cooking surface of cast iron and having the outer surface coated with electroplated nickel.

6. A food-cooking utensil of a cast ferrous metal having unclosed pores on the inner cooking surface adapted to admit grease thereinto, said utensil having an outer surface coated with electroplated metal of the class consisting of chromium and nickel.

7. An electroplated food-cooking utensil having the food-contacting inner surface of cast ferrous metal with unclosed pores to admit grease thereinto, said utensil having a rough and dark outside bottom surface for rapidly absorbing heat and having a lustrous outer side surface of electroplated metal of the class consisting of chromium and nickel.

HENRY E. ADELSPERGER, JR.
ANTHONY F. CASSIN.