April 21, 1970 C. P. PINCKARD 3,508,183

MAGNETICALLY RESPONSIVE SILVERWARE AND CHINAWARE

Filed Oct. 17, 1967

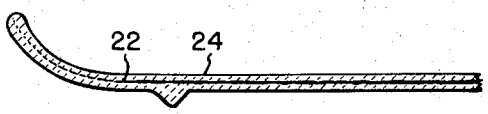


FIG. 1

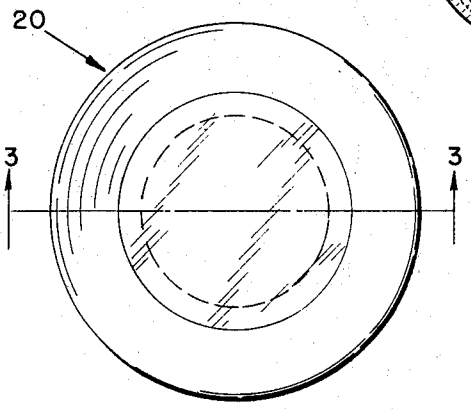


FIG. 2

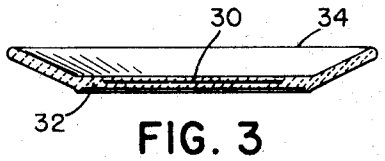


FIG. 3

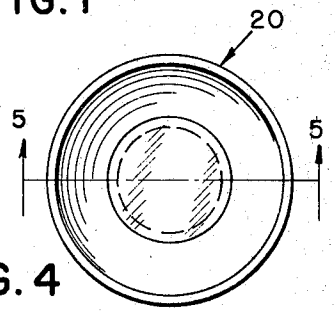


FIG. 4

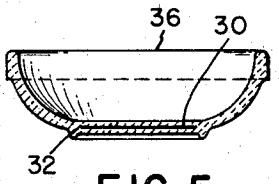


FIG. 5

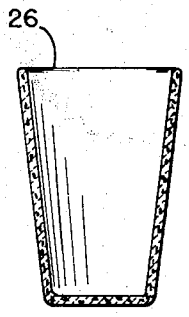


FIG. 8

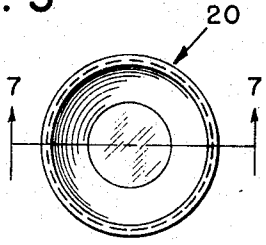


FIG. 6

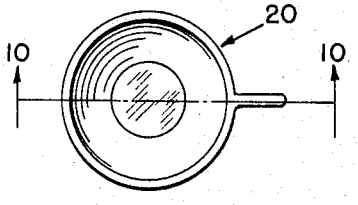


FIG. 9

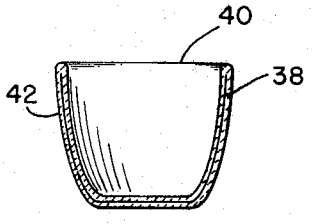


FIG. 7

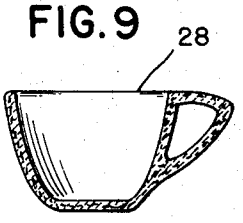


FIG. 10

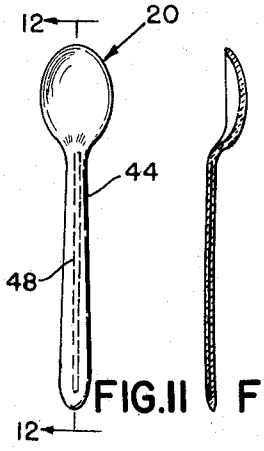


FIG. 11

FIG. 12

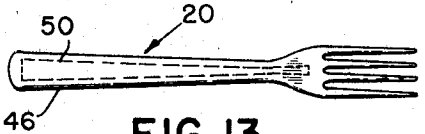


FIG. 13

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MAGNETICALLY RESPONSIVE SILVERWARE AND CHINAWARE

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Int. Cl. H01f 7/02
U.S. Cl. 335—303 6 Claims

ABSTRACT OF THE DISCLOSURE

Articles of silverware and chinaware which are formed from a shaped quantity of non-magnetic material and contain a preselective amount of magnetically attractive material to permit the attraction and movement of the article in response to a controlled magnetic field.

BACKGROUND, BRIEF SUMMARY AND OBJECTIVES OF THE INVENTION

Many dish-conveying and washing systems are presently in use which offer some automatic or semi-automatic features in that a degree of separation between dissimilar silverware and chinaware articles is achieved by means of deflector boards and the like which permit articles of various heights to pass while restraining other articles and diverting their movement to a secondary direction of travel. Recent developments in dish-conveying and washing systems have resulted in the construction and use of a magnetically controlled procedure for attracting, handling, sorting, washing and collecting articles of silverware and chinaware through the use of a number of magnetic attracting stations of various strength.

To cooperate with such a magnetic system, articles of silverware and chinaware have been designed which contain a preselected quantity of magnetically attractive particles discriminately positioned within article-shaped non-magnetic material so that the chinaware and silverware can be attracted and moved in response to a controlled magnetic field, articles having a greater quantity of magnetically attracted particles in proportion to their total weight being responsive to even the weakest field while those containing less particles being attracted only by the strongest fields.

The articles of chinaware and silverware developed for compatability with a magnetically controlled scullery system for classifying, washing and collecting magnetically responsive articles take the form of dishes, knives, spoons and the like, each article of which comprises generally a quantity of water and heat-resistant non-magnetic material shaped to form the particular article having a preselected quantity of magnetically attracted particles discriminately positioned within the non-magnetic material to allow the attraction and movement of the article in response to the various controlled magnetic fields. The article can contain a layer of non-magnetic material, a slug of such material or a random scattering of particles of the material in the event layers or cores are not practical in a particular situation. A ceramic or plasticized eating utensil is quite practical since a core or bar of magnetically responsive material can be positioned within the handle and the size of the core or bar can be varied so that classification and segregation of unlike articles and the collection of similar articles can be effected.

It is to be understood that when used throughout the present disclosure and claims, the term "chinaware" includes commonly used articles of dishwear and plasticwear, and refers to all forms of plates, dishes, glasses, bowls, cups, containers and the like which might be used as food servicing aids. Similarly, the term "silverware" when used herein includes all eating utensils including

forks, knives, spoons and the like formed from silver alloy, stainless steel, plastic, ceramic and other materials.

With the foregoing in mind, it is therefore an object of the present invention to provide an article in the form of a dish, knife, spoon and the like which will be responsive to controlled magnetic fields within article-classifying, sorting and collecting systems.

Another object of the present invention is to provide an article embodying a quantity of water and heat-resistant non-magnetic material surrounding discriminately positioned quantities of magnetically attracted particles to permit the attraction of the article in response to controlled magnetic fields.

A further object of the present invention is to provide eating utensils of the type described having various degrees of attractability to magnetic fields so that the articles may be classified, sorted and collected by magnetic means.

These and other objects of the present invention will become more apparent when taken in conjunction with the following detailed description considered in light of the figures illustrated herein wherein like characters of reference designate like parts.

FIGURE DESCRIPTION

FIG. 1 is an end elevational sectional and fragmentary view of a plate constructed in accordance with the present invention having a preselected quantity of magnetically attractive particles generally arranged to form a layer within the non-magnetic material of the plate.

FIG. 2 is a plan view of a plate showing in hidden lines a layer of magnetically attractive material embedded within the bottom portion of the plate.

FIG. 3 is an end elevational cross-sectional view of the plate taken along lines **3—3** of FIG. 2 showing the positioning of the magnetically attractive layer within the bottom portion of the plate.

FIG. 4 is a plan view of a bowl showing in hidden lines a magnetically attractive layer positioned in the bottom portion of that bowl.

FIG. 5 is a side elevational sectional view taken along the lines **5—5** of FIG. 4 showing the positioning of the magnetically attractive layer within the bottom portion of the bowl.

FIG. 6 is a plan view of another variation of a bowl showing in hidden lines a magnetically attractive liner held within the non-magnetic material of the article.

FIG. 7 is a side elevational sectional view of the bowl taken along the lines **7—7** of FIG. 6 showing the magnetically attractive liner held within the non-magnetic material of the article.

FIG. 8 is a side elevational sectional view of a drinking cup showing the layer or film of magnetically attractive particles discriminately positioned within the non-magnetic material of the cup.

FIG. 9 is a plan view of a coffee or tea cup containing discriminately placed articles of magnetically responsive material within the cup's non-magnetic structure.

FIG. 10 is a side elevational sectional view taken along the lines **10—10** of FIG. 9 showing the configuration of magnetically responsive particles positioned within the non-magnetic material of the cup.

FIG. 11 is a plan view of a spoon formed generally of non-magnetic material containing a core within its handle of magnetically responsive material.

FIG. 12 is a side elevational sectional view taken along the lines **12—12** of FIG. 11 showing the positioning of the core within the handle of the formed spoon.

FIG. 13 is a plan view of a fork formed generally from a non-magnetic material containing a slug or core of a greater size than shown in the spoon of FIG. 11 within the fork handle.

DETAILED DESCRIPTION

Referring now to the drawings and particularly to FIGS. 2, 4, 6, 9, 11 and 13, there are generally illustrated articles **20** representing eating utensils in the form of dishes, cups, a knife and spool. The articles are structurally formed from a plasticized non-magnetic material which is water and heat-resistant and which can be of any known composition now used in the manufacture of conventional low-cost chinaware items.

A first successfully proven procedure for producing an article that is magnetically responsive is to provide a discriminate quantity of magnetically attracted particles **22** throughout the interior of the plastic non-magnetic material **24**, the quantity of the particles **22** being varied according to the particular article of chinaware manufactured, for example, all plates might have a particle total equaling approximately five grams while all saucers will contain approximately 2½ grams of metal particles so that the individual article will be particularly responsive to a magnetic station having a magnetic field of a given strength.

The random placement of a discriminate quantity of metal particles throughout the non-magnetic material is equally adapted to glassware (FIG. 8) and cup (FIG. 10) construction, the weight of the particles contained therein being varied according to the particular article involved. Thus a glass **26** and a tea or coffee cup **28** can be supplied with a sufficient number of magnetically attracted particles to respond to one or more magnetic fields though the quantity of contained particles would differ from the quantity contained in other articles.

A variation in the construction of magnetically responsive articles of silverware and chinaware involves the positioning of a metallic layer **30** within the bottom **32** of a plate **34** or bowl **36**, and obviously such material will be equally suitable for response to a magnetic field of given strength. A further alternative construction includes the placement of a liner **38** throughout the wall structure of a cup **40** within the non-magnetic material **42** so that such a cup will be immediately responsive to a magnetic field of even the weakest configuration. The weight and coverage of this liner **38** will establish the degree of responsiveness desired for a given magnetic field.

Articles of silverware, such as a spoon **44** and a fork **46**, may be constructed of ceramic or plasticized material which will withstand extremely high temperatures for sterilization purposes, and these articles have been found to be most economically produced with desired magnetic characteristics by the positioning of a core or slug **48** within the spool or fork handle, that core being of dimensions suitable to be entirely surrounded by the non-magnetic material of the handle. To facilitate sorting and collecting of various articles of like classification, forks may be provided with a heavier core **50** so as to respond to a particular magnetic field at a selected station which would not attract, for instance, the spoon **44** because of the lighter core **48** therein. Thus because of the core or slug configuration within the article handle, all spoons are collected at a single magnetic station, all forks are then collected at a single separate magnetic station, while all knives are collected at still a third magnetic station of a given strength.

Thus it can be seen that the chinaware and silverware for a scullery system to classify, wash and collect magnetically responsive articles has been provided for. Such a scullery system permits segregating chinaware and silverware from carrying trays, separating refuse from chinaware and silverware items, segregating the chinaware from the silverware items, classifying the silverware items according to like articles, isolating said classified articles each from the other, cleansing the classified silverware items, classifying chinaware items according to like articles, isolating the classified articles each from the other, cleansing the classified chinaware articles and collecting commonly classified articles for subsequent distribution and use.

While there has been described only a few representative embodiments of the various articles of chinaware and silverware possible according to the disclosure herein, it will be obvious to those skilled in the art that any number of variations may be made in the construction of such articles and the inclusion of magnetically attracted materials within those articles to respond to magnetic fields of varying strength without departing from the real spirit and purpose of the invention, and such modifications are contemplated.

I claim:

1. An article in the form of a dish, knife, spoon and the like for selective movement in response to a controlled magnetic field comprising: a quantity of water and heat-resistant non-magnetic material shaped to form an article adapted to be used as an eating utensil a preselected quantity of magnetically attractive particles discriminantly positioned within said non-magnetic material, said magnetic particles being selectively and discriminately positioned substantially throughout a major portion of said article for movement responsive to a predetermined magnetic field irrespective of the relative position of the article with respect to the field.

2. An article as claimed in claim **1**, said magnetically attractive particles arranged to form a layer within said non-magnetic material.

3. An article as claimed in claim **1**, said magnetically attractive particles positioned to form a slug within said non-magnetic material.

4. An article as claimed in claim **1**, the article being laminated with a top layer of non-magnetic material and a lower layer of non-magnetic material bonded about said magnetically attractive particles.

5. An article as claimed in claim **1**, said magnetically attractive particles being varied in quantity to be responsive to the permeability of a preselected magnetic field and non-responsive to the permeability of another magnetic field.

6. An article as claimed in claim **4**, said magnetically attractive particles being varied in quantity to be responsive to the permeability of a preselected magnetic field and non-responsive to the permeability of another magnetic field.

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GEORGE HARRIS, Primary Examiner

U.S. Cl. X.R.

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