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3,194,468

PLASTIC DRINKING CUPS

Filed June 11, 1962

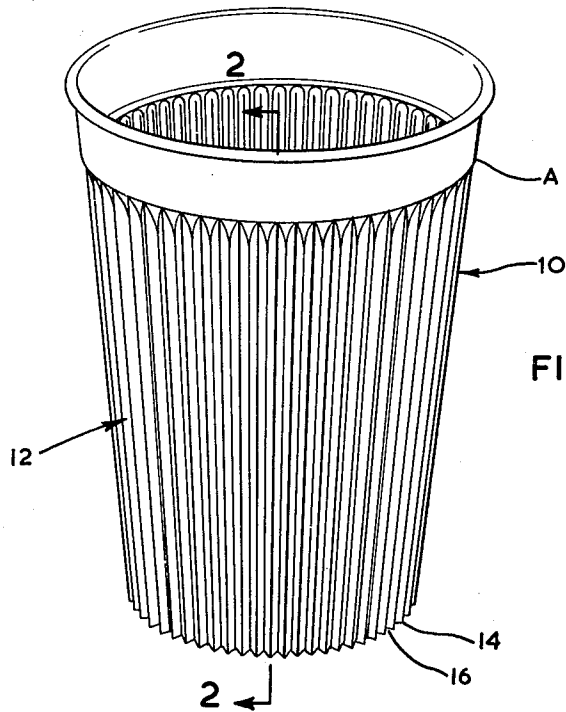


FIG. 1

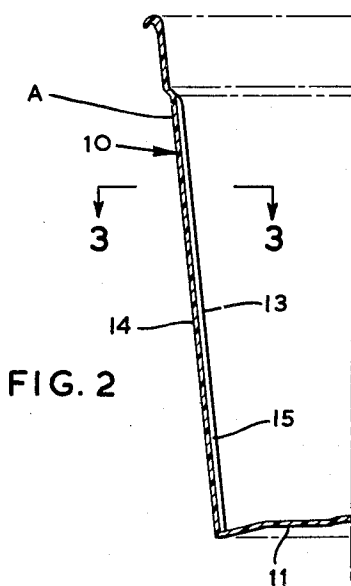


FIG. 2

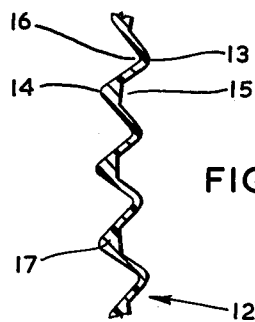


FIG. 3

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PLASTIC DRINKING CUPS

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2 Claims. (Cl. 229—1.5)

This invention relates to thin-walled plastic drinking cups particularly of the disposable variety.

Disposable drinking cups formed from processed paper have been used for many years but, of course, due to their nature and yieldably they are not as preferable to use as more rigid drinking container. Due to material advances in the plastic industry, it has now been possible economically to provide disposable thin-walled drinking cups formed from plastic. However, while the plastic cup is much more desirable from the point of view of its rigidity compared to paper cups and while both have the disadvantage that heat is readily transferred through them when they contain hot beverages, the more dense thin-walled plastic tends to transfer heat to the user's hand a little more quickly as to bring about a disadvantage in this respect. A proposal has previously been made to form a cup of this kind, having a smooth interior surface, with external closely spaced apart protruding ribs having intervening valleys with a view to reducing its heat transferring characteristics to the hand of the user by causing the contacting surface of the user's hand to engage the peaks of said ribs while spanning the valleys formed therebetween, thus to provide air circulating heat dissipating channels. While such a proposal has had some effect towards achieving this objective, it has not been possible to provide ribs of sufficient depth in such a thin-walled product to achieve the desired results.

The present invention avoids the difficulties previously encountered in attaining the objective while providing additional advantages over the prior proposals. According to the present invention, I provide a thin-walled plastic cup defined by a circumferential side wall and a base wherein the side wall is corrugated to form on the inside and outside surfaces a plurality of corresponding closely and circumferentially spaced longitudinally extending substantially parallel ribs and valleys of substantial depth, the spacing between the ribs being sufficiently close as to cause the contacting surfaces of the user's hand to engage the peaks of said ribs while spanning the intervening valleys and wherein said valleys form heat dissipating air circulating channels.

The invention will be clearly understood by reference to the following detailed specification taken in conjunction with the accompanying drawings.

In the drawings:

FIG. 1 is a perspective illustration of the cup of the present invention.

FIG. 2 is a longitudinal section taken along the line 2—2 of FIG. 1; and

FIG. 3 is a fragmentary transverse section through the wall of the cup taken substantially along the line 3—3 of FIG. 2.

Referring to the drawings, A indicates a thin-walled thermo-plastic cup of generally conventional outline formed by injection molding and providing a hollow open topped body defined by a circumferential side wall 10 joined by an integral base 11. The side wall 10, as shown, is of a corrugated form indicated at 12 as to form on the inside and outside walls a plurality of corresponding ribs and valley 13 and 14, respectively, and 15 and 16, respectively (FIG. 3), which ribs and valleys are disposed longitudinally of the cup body and are spaced

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apart circumferentially of the cup relatively closely such that this ribbing forms a gripping area so that the contacting surfaces of the user's hand engage the peaks of the external ribs while spanning the intervening external valleys, thus to provide by way of the external valleys practical heat dissipating air circulating channels. By forming the ribs as corrugations so they occur on both the inside and outside of the cup wall, I am able to achieve reasonably deep valleys as to produce practical air circulating channels whereas in addition, the formation gives the cup a degree of flexibility such as to avoid possibility of fracture in normal use which can occur in a thin-walled stiffer body. In addition, it is possible to produce a cup from less material, thus achieving an economic advantage as well.

I prefer to form the external ribs in such a way as to provide a thicker wall at the apex thereof as indicated at 17 in FIG. 3. This tends to reduce the heat conductivity and tends to strengthen the structure but what is of more importance, the formation of these thicker apices has the additional important effect of making it possible to produce a very thin-walled cup while changing the direction of flow of the plastic for the thinner sections, thus obtaining a reorientation of the plastic which adds to the strength and physical properties of the article. This is achieved through the fact that as the hot fluid plastic is injected into the mold it follows the line of least resistance, i.e. the deeper cavities for the thicker section forming the thick apices of the ribs and then tends to expand circumferentially to fill the thinner sections. Consequently, a much stronger cup is produced whereas if the larger apices in the mold were not employed, it would be necessary to provide for a thicker walled cup to achieve a structure of this character. Therefore, a substantial saving in plastic material is attained. It is preferred to form the wall of a thickness between .010" and .020" and to provide a thickness between .035" and .040" at the apices of the external ribs. However, it should be understood that while the preferred form of construction employs thick apices as described, the invention in its broadest aspect is not limited to this most practical formation and would apply to a thicker walled corrugated cup where this may be of practical use.

In addition to the advantages above defined, three further advantages are achieved in a cup of this formation since it permits better nesting of the cups for packaging and storage purposes, whereas from the point of view of health and the difficulty of washing an internally grooved cup, it discourages re-use of improperly washed cups which would not be detected in the plainer variety. Moreover, it will help to discourage mobile beverage dispensers from re-using cups to dispense more of the beverage than would normally be accounted for by the number of cups that he is issued when starting out on his sales tour. This is so because even if he retrieves some of the used cups and attempts to rinse them for re-use, there will always be some indication by way of the internal valleys of its previous use, leading to the detection of such an improper practice.

Finally, and of particular importance, is the fact that the cup constructed according to the present invention can be manufactured faster than ordinary varieties through the fact that due to the corrugations, a greater surface area is exposed to the cooling effect of the dies so that the forming cycle can be shortened over that of the ordinary variety as to thus increase speed of production. Consequently, measured by the sum of the advantages, it is clear that the present invention achieves a marked advance in the art.

What I claim as my invention is:

1. An injection moulded plastic cup comprising a hollow, thin walled, open topped body, defined by a circumferential sidewall and an integral base, said sidewall between its top and bottom being of corrugated form providing a series of alternating substantially parallel internal and external ribs and valleys extending in the direction of the longitudinal axis of said body, said external ribs terminating in peaks which form a gripping area for the hand of a user, the spacing between the ribs being sufficiently close as to cause the contacting surfaces of the user's hand to engage the peaks of said ribs while spanning the intervening external valleys, said external valleys forming heat-dissipating air circulating channels, said ribs and valleys being formed by converging portions of said side wall, said valleys on the inside of said side wall being augmented with plastic where the portions of the side wall converge to thicken and strengthen the ribs on the outside of said side wall.

2. A moulded plastic cup as claimed in claim 1, in which the thickness of the side wall adjacent where the corrugations thereof coverage to form said valley on the

inside of said side wall is between .010" and .020" and the thickness of the external ribs at their peaks is between .035" and .040".

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