The present invention relates to a molding die and more particularly to a molding die for making an article of molded pulp having a flange and a rolled, screened edge.

Where containers and cartons are destined to be used only a few times, and therefore to be produced and sold as economically as possible, the fabrication of such containers and cartons from molded pulp is indicated, since the molded pulp fabrication processes and techniques are known to be among the most economical ways of fabricating containers and cartons. Such containers and cartons have been known for many years, and though these containers and cartons first appeared as relatively rough articles, through the years efforts have been made to improve the appearance of the molded pulp articles so that they will be readily acceptable to the trade even though they must still be made as economically as possible.

On one known molded pulp container, used extensively in the packaging of such fresh foods as meat products and fruit, the food is placed in the container and the food and the container then enclosed in a wrapping of transparent material, such as cellophane. These containers are now extensively manufactured with a flat bottom, tapered uprising sides, and a peripherally extending flange. The interior of the container and the upper side of the peripherally extending flange are made against the molding screen, and thus have a fairly smooth and pleasing appearance. The addition of a rolled and screened lip will further enhance the attractive appearance of the container and not materially increase the cost thereof.

With the desideratum of producing such a container, however, there is unknown in the art a suitable mold for obtaining this container. In one known prior art die, resort was had to a mechanical rolling of an edge of a molded pulp article in order to obtain a rolled edge. Obviously, such a rolling is highly expensive as it necessitates the further handling and processing of the molded pulp article. In another known die for molded articles, a rolled edge on an uprising wall was obtained, but only the hidden underside of the rolled edge was in contact with the screen, so that the visible part of the article had a rough appearance. In still another known prior art construction, the mold was so constructed that the resulting edge of the flange was not rolled, but was simply defined by a marginal ring.

In the making of dies to be used for making molded pulp articles, the usual practice is to machine the mold part of the die from a heavy metal, such as brass, to drill through the mold from one surface to the other, and to then place screening over the molding face of the mold. The placing of the screen on the mold is a difficult, time-consuming and tedious task even where the mold is of simple configuration. Thus, it is not unusual to cut the screen necessary so that when it is placed on a curved surface the cut edges will come together into a joined or mating juncture. In addition, the more complicated the shape to be molded, the more difficult it is to produce the necessary shape of screen from the flat or planular sheets of screens which are the starting material.

In the prior art die construction, it has been generally necessary to either use one continuous piece of screen or alternatively separate pieces of screen have had to be joined together so that they acted and functioned as one piece of screen.

An object of the present invention is to provide a die capable of molding a rolled, screened lip article.

A further object of the present invention is the provision of a die for making a molded pulp product having a rolled, screened lip, which die is relatively simple and inexpensive.

Yet another object of the present invention is to provide a die for making a molded pulp article having a rolled, screened lip wherein separate screens may be used to form the rolled, screened lip.

Other objects and the nature and advantages of the instant invention will be apparent from the following description taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a plan view of a container made in accordance with the die of the present invention, said container being in inverted position;

Fig. 2 is a cross-sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a partial plan view of a die according to the present invention for making the container of Fig. 1; and

Fig. 4 is a cross-sectional view taken on the line 4—4 of Fig. 3.

Referring now to the drawing, there is shown in Fig. 1 a container 10 having a flat bottom 11, flaring side walls 12, an outwardly extending flange 13 and a rolled, screened lip 14 on the flange 13. As may be clearly seen in Fig. 2, when the container 10 is in its normal position, the rolled lip 14 will be downwardly extending and present a finished and pleasing appearance to the viewer.

Referring now to Figs. 3 and 4, there is shown therein an illustrative part of a die 20 for molding the container 10 shown in Figs. 1 and 2. The die 20 comprises a mold 21 having a generally flat upper surface 22 and sloping sides 23 descending therefrom. At the base of the side 23 there is a flat annular surface 24; it will be apparent that flat upper surface 22 will serve to mold the bottom 11 of the container, that side 23 will mold the side walls 12 of the container and that annular lower surface 24 will mold the outwardly extending flange 13 of the container 10.

Mold 21 has an annular flange 26 thereon outwardly of the annular lower surface 24, and annular flange 26 has a groove 27 in the upper surface 22 thereof.

Holes 29 extend through the mold 21 throughout the upper surface 22, sides 23 and lower surface 24 to communicate the molding and suction sides of the mold, in known manner. Holes 31 are also provided through the flange 26 to communicate the groove 27 and the suction side of the mold 21.

Surmounting the flange 26 is a molding ring 32 having a groove 33 on the underside 34 thereof; molding ring 32 has an upstanding inner face 34 and holes 36 through the molding ring 32 and communicating the face 34 with the groove 33 thereof. It is the upstanding inner face 34 which suction molds the lip 14.

A screen means 40 extends over the molding side of mold 21 and between the molding ring 32 and the flange 26. A second screening means 41 extends between the molding ring 32 and flange 26, across upstanding inner face 34 and along the top of molding ring 32.

To secure the aforementioned parts of the die 20 together, there is provided a top deckle ring 45 through which there extends a plurality of bolts, bolt 46 being shown in Fig. 4. The bolts, such as bolt 46, extend through top deckle ring 45 and molding ring 32 into or
beneath flange 26 where they are secured in known manner.

It will, of course, be understood that the die 20 as shown and described is placed in a molding box which is connected with a source of vacuum by appropriate conduits, or in known fashion to those skilled in the art.

In operation, the parts of the die 20 will be made and assembled as herein shown, and the die associated with a suction box as above noted, the die will then be placed in a pulp slurry, suction applied, and molded pulp will be sucked against the molding side so as to mold the container 10 with the bottom 11, sides 12, flange 13 and the rolled, screened lip 14. To accomplish this, suction will be applied to the molding sides of the die through the holes 29; suction will also be applied to the inner face 34 through the hole 36, the groove formed by the grooves 33 and 27, and the hole 31.

It will thus be seen that there has been provided a molding die of simple and inexpensive construction enabling the production of an article such as a container having a rolled, screened lip on a flange thereof, and employing a plurality of screen means.

It will be obvious to those skilled in the art that various changes may be made without departing from the spirit of the invention and therefore the invention is not limited to what is shown in the drawings and described in the specification but only as indicated in the appended claims.

What is claimed is:

1. A die for making a molded pulp container with a rolled and screened lip comprising a mold having a generally flat upper surface, sloping side surfaces descending from said upper surface and a flat outwardly extending lower surface, said surfaces defining a molding side of said die, said die having a suction side opposite said molding side, screen means over said surfaces, holes through said mold communicating the molding and suction sides thereof, whereby to form a flanged container, a flange on said mold outwardly of said lower surface, said flange having a groove in the upper surface thereof, holes communicating said groove with the suction side of said mold, a molding ring surrounding said flange and having a groove on the underside thereof overlying the groove of said flange, said molding ring having an upstanding inner face, screen means over said face, holes through said ring communicating said molding and suction sides thereof, whereby to form a flanged container, a flange on said mold outwardly of said lower surface, said flange having a groove in the upper surface thereof, holes communicating said groove with the suction side of said mold, a molding ring surrounding said flange and having a groove on the underside thereof overlying the groove of said flange, said molding ring having a flanged face adjacent and at an angle to said peripherally extending surface, and means extending through said molding ring to the molding face thereof for communicating said molding face and the suction side of said mold.

2. A die according to claim 1, wherein said molding ring has a rolled and screened lip, whereby to form an article with a rolled and screened lip.

3. A die according to claim 2, wherein said molding ring has a rolled and screened lip, whereby to form an article with a rolled and screened lip.

4. A die for making a molded pulp article with a rolled and screened lip comprising a mold for forming a flanged article, said mold having suction and molding sides and holes therethrough communicating said sides, said mold having a peripherally extending surface for forming the flange of said article, a flange on said mold outwardly of said surface, said flange having a groove in the upper surface thereof, holes communicating said groove with the suction side of said mold, a molding ring surrounding said flange and having a groove on the underside thereof overlying the groove of said flange, said molding ring having an upstanding inner face, holes through said ring communicating said face and the groove of said molding ring, and means securing said molding ring and mold together, whereby to form an article with a rolled and screened lip.

5. A die according to claim 4, wherein said inner face and second screen means are over the remaining molding surfaces.

6. A die for making a molded pulp article with a rolled and screened lip comprising a mold for forming a flanged article, said mold having suction and molding sides and holes therethrough communicating said sides, said mold having a peripherally extending surface for forming the flange of said article, a flange on said mold outwardly of said surface, a molding ring on said flange, said molding ring having a flanged face adjacent and at an angle to said peripherally extending surface, and means extending through said molding ring to the molding face thereof for communicating said molding face and the suction side of said mold.

7. A die according to claim 6, wherein said molding ring has a rolled and screened lip, whereby to form an article with a rolled and screened lip.

8. A die for making a molded pulp container with a rolled and screened lip comprising a mold having a generally flat upper surface, sloping side surfaces descending from said upper surface and a peripherally extending lower surface adjacent said side surfaces, said surfaces defining a molding side of said die, said die having a suction side opposite said molding side, holes through said mold communicating the molding and suction sides thereof, whereby to form a flanged container, a flange on said mold outwardly of said lower surface, said flange having a groove in the upper surface thereof, holes communicating said groove with the suction side of said mold, a molding ring surrounding said flange and having a groove on the underside thereof overlying the groove of said flange, said molding ring having a flanged face adjacent and at an angle to said peripherally extending surface and means extending through said molding ring to the molding face thereof for communicating said molding face and the suction side of said mold.

9. A die according to claim 8, wherein said molding ring has a rolled and screened lip, whereby to form an article with a rolled and screened lip.

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