United States Patent

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[54] **GELATIN DIP POT**
8 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **259/6,** 259/104, 18/24
[51] **Int. Cl.** **B01f 7/02,** B29b 1/10
[50] **Field of Search** 259/6, 104, 103, 21, 40, 41, 95; 18/24, 41

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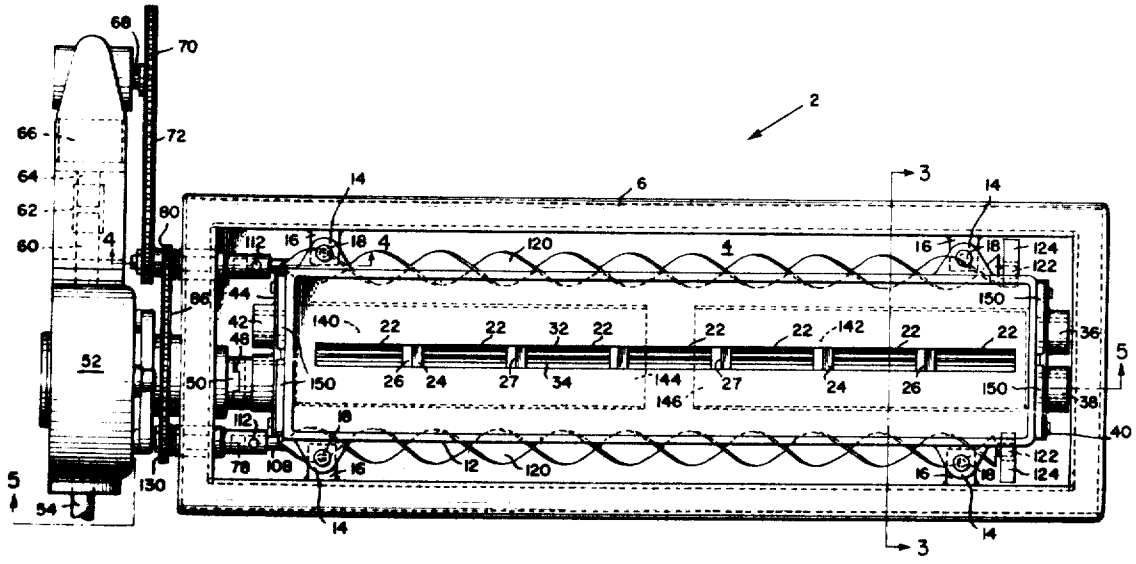
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ABSTRACT: A conventional gelatin dip pot for making capsules having a dip tank suspended in a reservoir tank and a gear pump drawing from along the length of the reservoir tank to supply the dip tank is provided with means having a single inlet opening to provide for the supply of gelatin from a single location in the reservoir tank and is provided with longitudinal helical mixing paddles mounted in the reservoir tank along side the dip tank.



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SHEET 1 OF 4

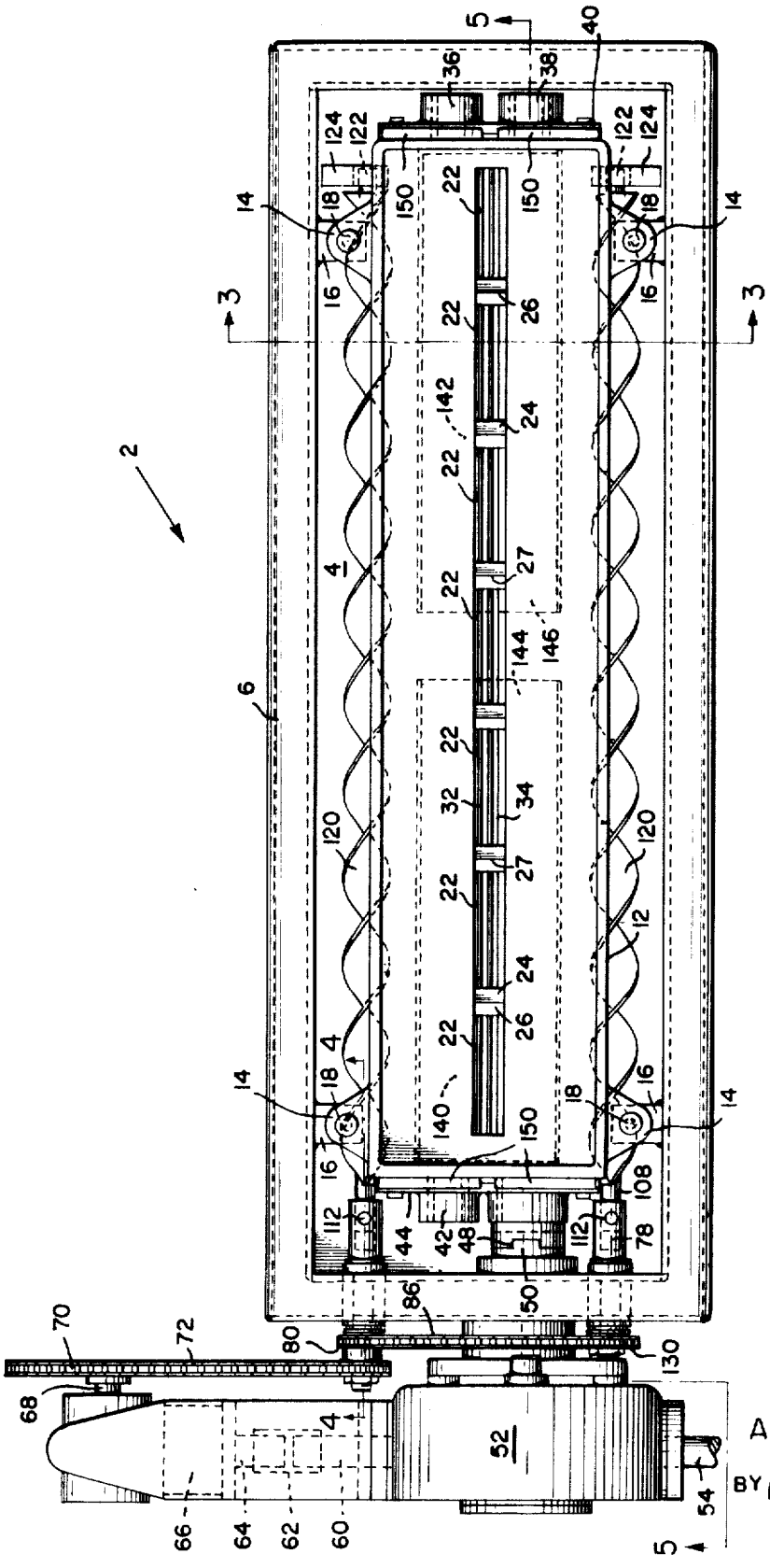


FIG. 1.

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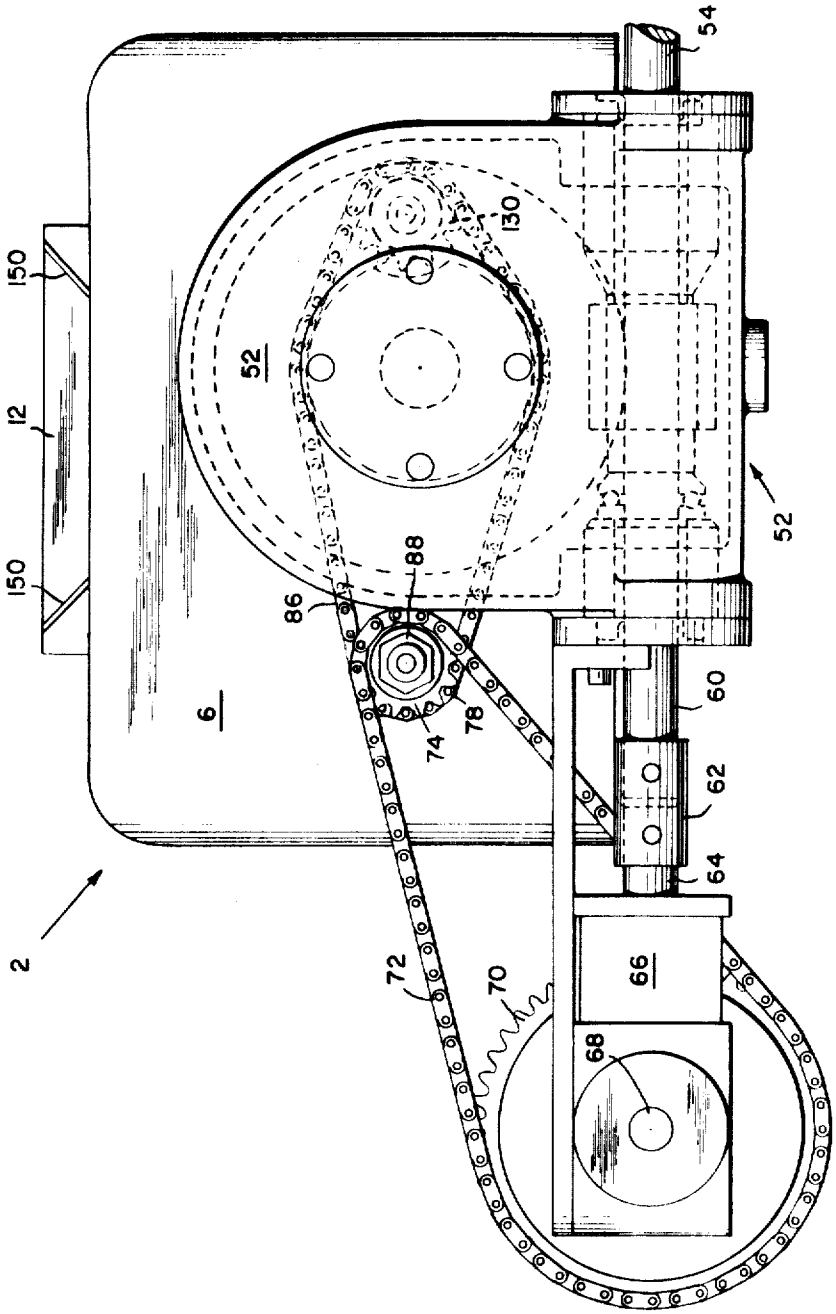


FIG. 2.

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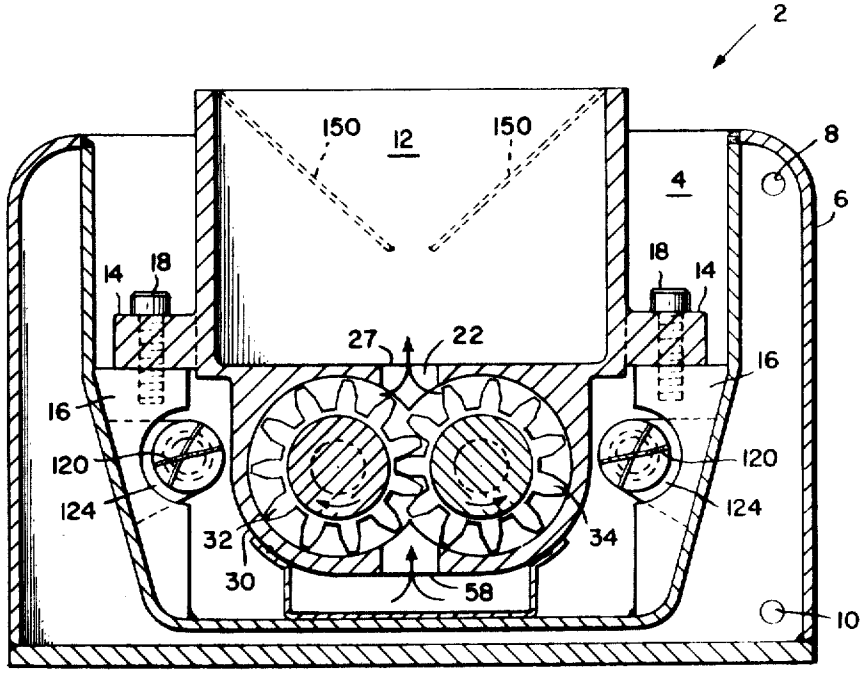


FIG. 3.

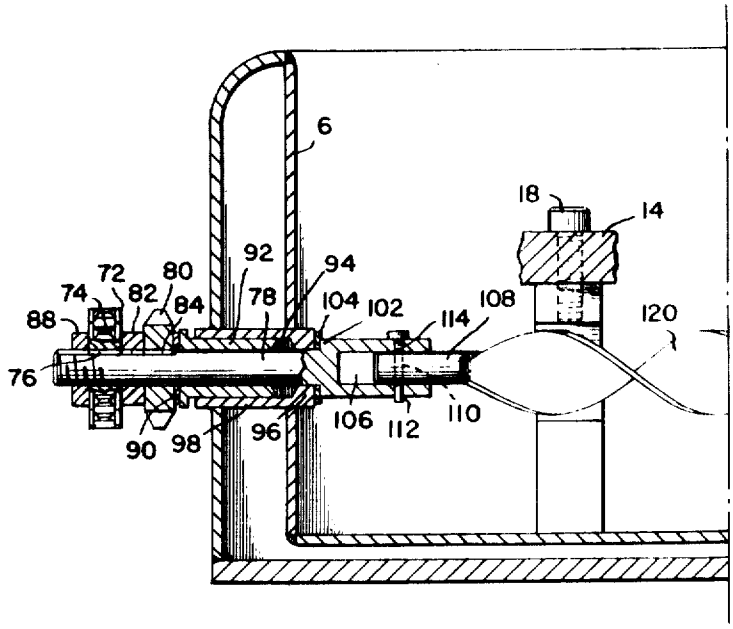


FIG. 4.

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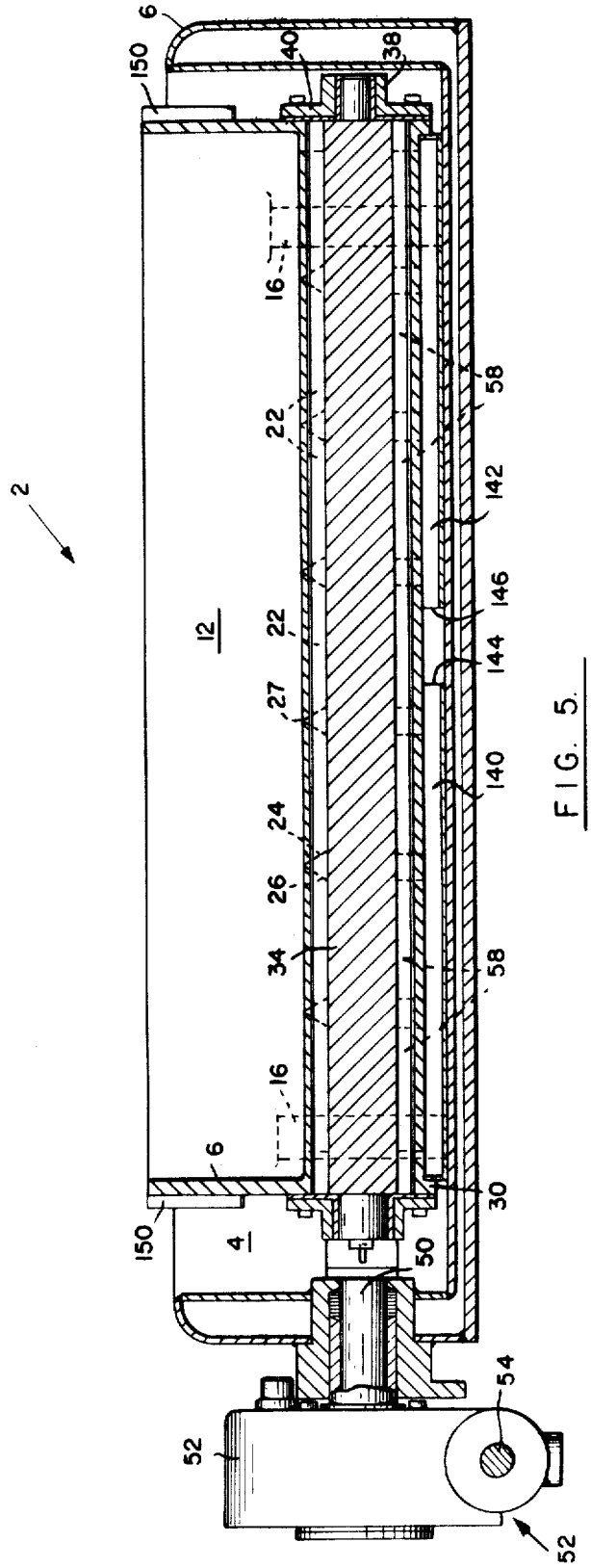


FIG. 5.

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GELATIN DIP POT

BACKGROUND OF THE INVENTION

In making gelatin capsules, pins are dipped into gelatin con-
ned in what is known in the trade as a dip pot. The conven-
nal dip pot has a dip tank suspended in a reservoir tank with
: dip tank being supplied with gelatin by a long gear pump
thdrawing gelatin from multiple positions along the length
the reservoir tank. This results in a nonuniform gelatin in
: dip tank and hence results in a lack of uniformity in the
psules.

Gelatin is a peculiar material particularly in that it is ex-
:mely difficult to provide a uniform gelatin product even in a
ıall tank. Of primary importance is the fact that the age of
: gelatin results in wide variations in the consistency of the
latin. Variations in consistency of the gelatin causes varia-
ns in the thickness of the capsule walls. Thus in making cap-
les, it is important to approach substantial uniformity of
nsistency of the gelatin.

It has been found that by supplying the entire length of the
ar pump from a single location in the reservoir tank, a
ırked improvement in the uniformity of the gelatin in the
ɔ tank is achieved.

In addition, it is well known in the art that gelatin is ex-
:mely difficult to mix to achieve uniformity. In accordance
th this invention it has been found that the uniformity of the
latin in the reservoir tank is greatly improved by the em-
ɔyment of helical paddles extending longitudinally in the
servoir tank alongside the dip tank. Unexpectedly, this su-
rior mixing has been achieved by operating the helical pad-
:s at a relatively high r.p.m. at which speed the gelatin is
ıable to move longitudinally as rapidly as the helix of the
ıddle advances. The paddles markedly reduce the striation
the gelatin. The rapidly moving helical paddles provide for
rapid mixing of fresh additions of gelatin or coloring materi-
; to the reservoir tank.

SUMMARY OF THE INVENTION

To a conventional gelatin dip pot having a dip tank
spended in a reservoir tank and supplied with gelatin from
idely spaced areas in the reservoir tank by pump means there
added means to restrict the withdrawal of gelatin to a single
cation in the reservoir tank and helical mixing paddles ex-
nding longitudinally in the reservoir tank alongside the dip
nk which are rotated at a relatively high speed to mix the
:latin in the reservoir tank.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a gelatin dip pot in accordance with
:e invention;

FIG. 2 is an end elevation of the dip pot of FIG. 1;

FIG. 3 is a vertical section taken on the plane indicated by
:e line 3–3 of FIG. 1;

FIG. 4 is an enlarged vertical sectional view of a portion of
:e mechanism for rotating the helical paddles; and

FIG. 5 is a vertical section taken on the plane indicated by
:e line 5–5 in FIG. 1.

PREFERRED EMBODIMENT

Referring first to FIG. 1, a gelatin dip pot 2 has a reservoir
ınk 4 formed with a hollow wall 6 the interior of which is con-
nuously supplied with hot water through plug 8 and drained
ırough plug 10 (FIG. 3) to maintain the tank at desired tem-
:rature generally about 120° F.

A dip tank 12 is suspended in tank 4 by virtue of lugs 14
:ing mounted on brackets 16 and secured thereto by
ıachine screws 18. The bottom of tank 12 along its length is
rovided with a series of openings 22 which are bordered by
ıpered walls 24 and 26. Openings 22 communicate with the
ıterior of a gear pump casing 30 (FIG. 3) which contains

pump gears 32 and 34 mounted in bearings 36 and 38 respectively which are affixed to end plate 40 (FIG. 1). Gear 32 is also mounted in bearing 42 and end plate 44. Gear 34 is coupled as indicated at 48 to a shaft 50 driven by gearbox 52 which in turn is driven by a drive shaft 54.

As thus described, with the exception of the walls 24 and 26 being tapered, the above described dip pot is conventional and widely known to those skilled in the art. The additional improvements of this invention will now be described.

Gear box 52 has an output shaft 60 (FIG. 2) which is coupled at 62 to a shaft 64 which drives gearbox 66. Gearbox 66 in turn drives shaft 68 on which is mounted a sprocket 70 which drives a chain 72. Chain 72 is connected to a sprocket 74 which is keyed at 76 to a shaft 78 (FIG. 4). Sprocket 74 is spaced from a sprocket 80 by a sleeve 82. Sprocket 80 is keyed at 84 to shaft 78 and drives a chain 86. A nut 88 is threaded to shaft 78 and urges sprocket 80 against a washer 90 which abuts against a sleeve member 92 which in turn is urged against packing 94 retained by flange portion 96 of tube 98 secured in wall 6. Shaft 78 is provided with a shoulder 102 which abuts against a washer 104 which in turn abuts against flange 96. Shaft 78 has a hollow end portion 106 which receives a shaft 108 provided with an opening 110 which receives a pin 112 which is threadedly connected at 114 to shaft 78.

Shaft 108 is secured to a helical paddle 120 which at its other end is secured to a stub shaft 122 mounted in a bearing 124 (FIG. 1).

Chain 86 drives a sprocket 130 which is secured to a shaft 78, shortened to clear gearbox 52. Shaft 78 is secured to a shaft 108 connected to a helical paddle 120 which is also connected to a shaft 122 mounted in a bearing 124.

A pair of spaced manifold members 140 and 142 (FIG. 5) are secured to casing 30 by welding and permit entrance therein only through the open ends thereof 144 and 146 respectively. Thus all gelatin withdrawn from the reservoir tank 4 by gears 32 and 34 comes from the small area between the open ends 144 and 146 of manifold members 140 and 142.

OPERATION

In operation, reservoir tank 4 is filled with gelatin and shaft 54 is rotated by driving means (not shown). The rotation of helical paddles 120, 120 urges the gelatin in the lower portion of tank 4 to the right as viewed in FIG. 1, since the helical paddles 120, 120 are rotating in a counterclockwise direction as viewed in FIG. 3. The paddles 120, 120 advantageously are rotated at a speed in the range of from about 150 to about 275 r.p.m. which produces an apparent linear travel of the helices which is substantially greater than the rate of longitudinal travel of the gelatin. With the helical paddles 120, 120 in operation the advance of the gelatin longitudinally to the right as viewed in FIG. 1 in the lower portion of tank 4 results in a counterflow of gelatin to the left in the upper portion of the tank. The gelatin is mixed rapidly.

Gearbox 52 rotates pump gear 34 counterclockwise as viewed in FIG. 3 causing the rotation of gear 32 and causing the withdrawal of gelatin having uniform consistency from the single area in tank 4 which lies between open ends 144 and 146 of manifold member 140 and 142. The supply of gelatin to dip tank by pump gears 32 and 34 causes gelatin to overflow from dip tank 12 into tank 4.

The provision of sloping strips 150, 150 at either end of the dip tank 12 in a V configuration channels the gelatin overflowing the ends of tank 12 towards the center line of tank 4 which insures circulation of gelatin in the central portions of the ends of tank 4.

Adjacent tapered walls 24 and 26 in effect form a bridge having a narrow top 27 to prevent gelatin dead spots above the bridge.

I claim:

1. In a gelatin dip pot for making capsules having:

a reservoir tank,

a dip tank suspended in the reservoir tank,

a housing extending along the bottom of the dip tank,

first passage means interconnecting a substantial portion of the bottom of the dip tank with the interior of the housing,

second passage means along the bottom of the housing interconnecting the interior and exterior of the housing and,

pump means to pull liquid through the second mentioned passage means and pump it through the first mentioned passage means into the dip tank.

The improvement comprising:

manifold means attached to the bottom of said housing, communicating with the second passage means and having a single inlet opening.

2. The device of claim **1** in which the first passage means comprises a plurality of passages with walls therebetween each tapered to a narrow top.

3. The device of claim **2** in which the first passage means

comprises a plurality of passages with walls therebetween each tapered to a narrow top.

4. The device of claim **1** in which the dip pot has sloping guide strips on each outer end to direct overflowing gelatin to the center of the reservoir tank.

5. The device of claim **1** having a helical mixing paddle mounted longitudinally in the reservoir tank along each side of the dip tank, and

means to rotate each mixing paddle.

6. The device of claim **5** in which the paddles are rotated at from about 150 to about 275 r.p.m.

7. The device of claim **5** in which the first passage means comprises a plurality of passages with walls therebetween each tapered to a narrow top.

8. The device of claim **5** in which the dip pot has sloping guide strips on each outer end to direct overflowing gelatin to the center of the reservoir tank.