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**Payne et al.**

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(54) **FILL SYSTEM FOR FORMING MACHINES**

(58) **Field of Classification Search**  
USPC ..... 425/572, 574; 264/328.8  
See application file for complete search history.

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(56) **References Cited**

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 626 days.

4,043,002 A	8/1977	Brackman	
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(21) Appl. No.: **12/800,887**

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*Primary Examiner* — Tim Heitbrink

(65) **Prior Publication Data**

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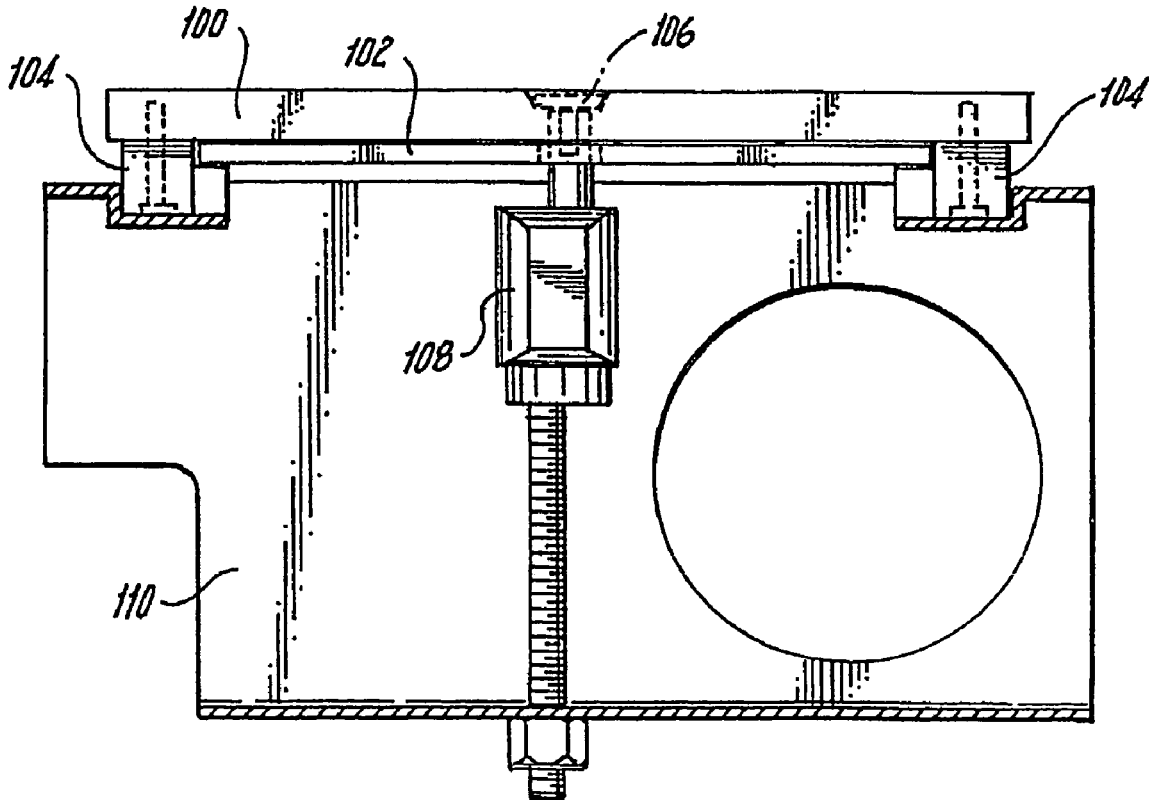
(51) **Int. Cl.**  
**B29C 45/18** (2006.01)

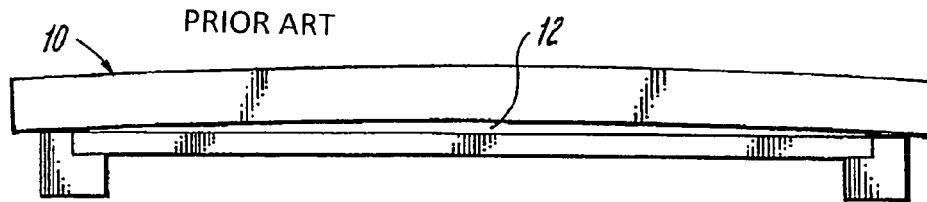
(57) **ABSTRACT**

A hold-down tooling package that maintains the dimensional integrity between the product manifold, shear and fill plate.

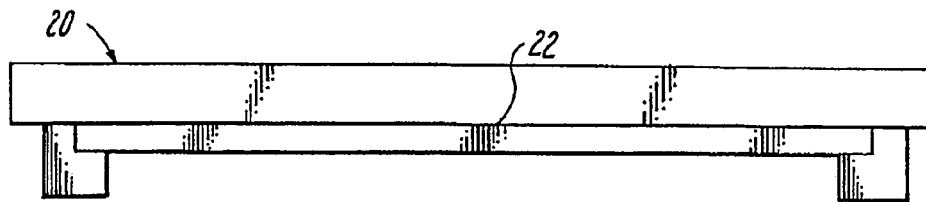
(52) **U.S. Cl.**  
USPC ..... 425/572; 264/328.8; 425/574

**16 Claims, 5 Drawing Sheets**

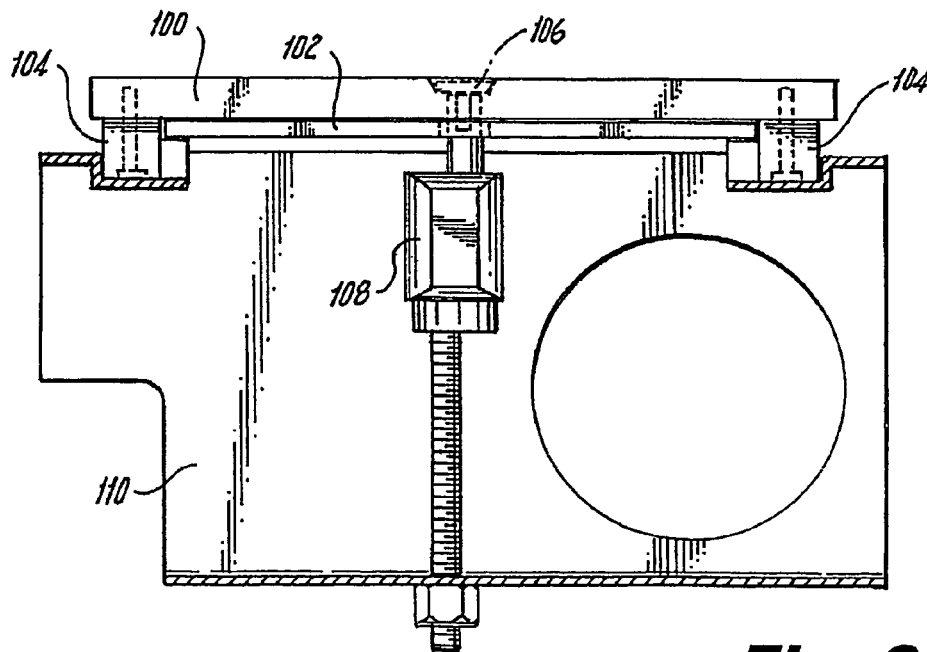




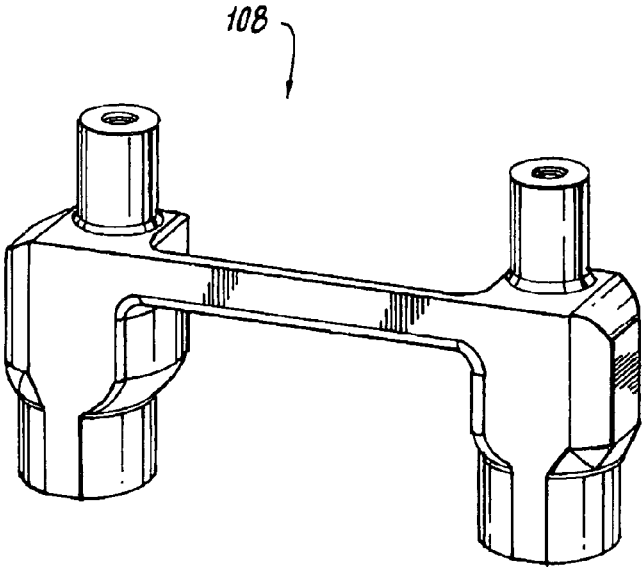
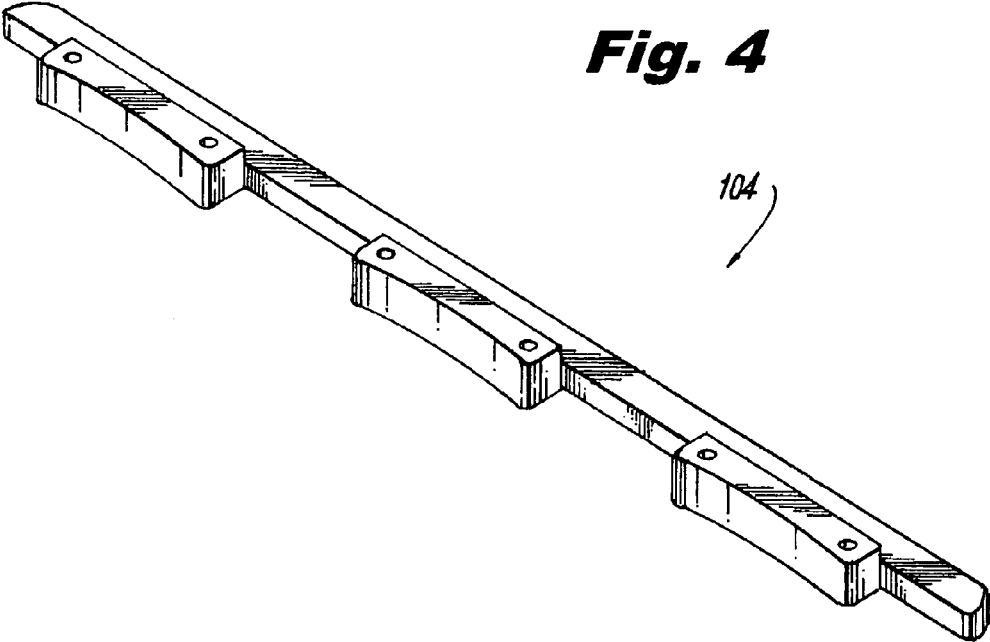
**Fig. 1**



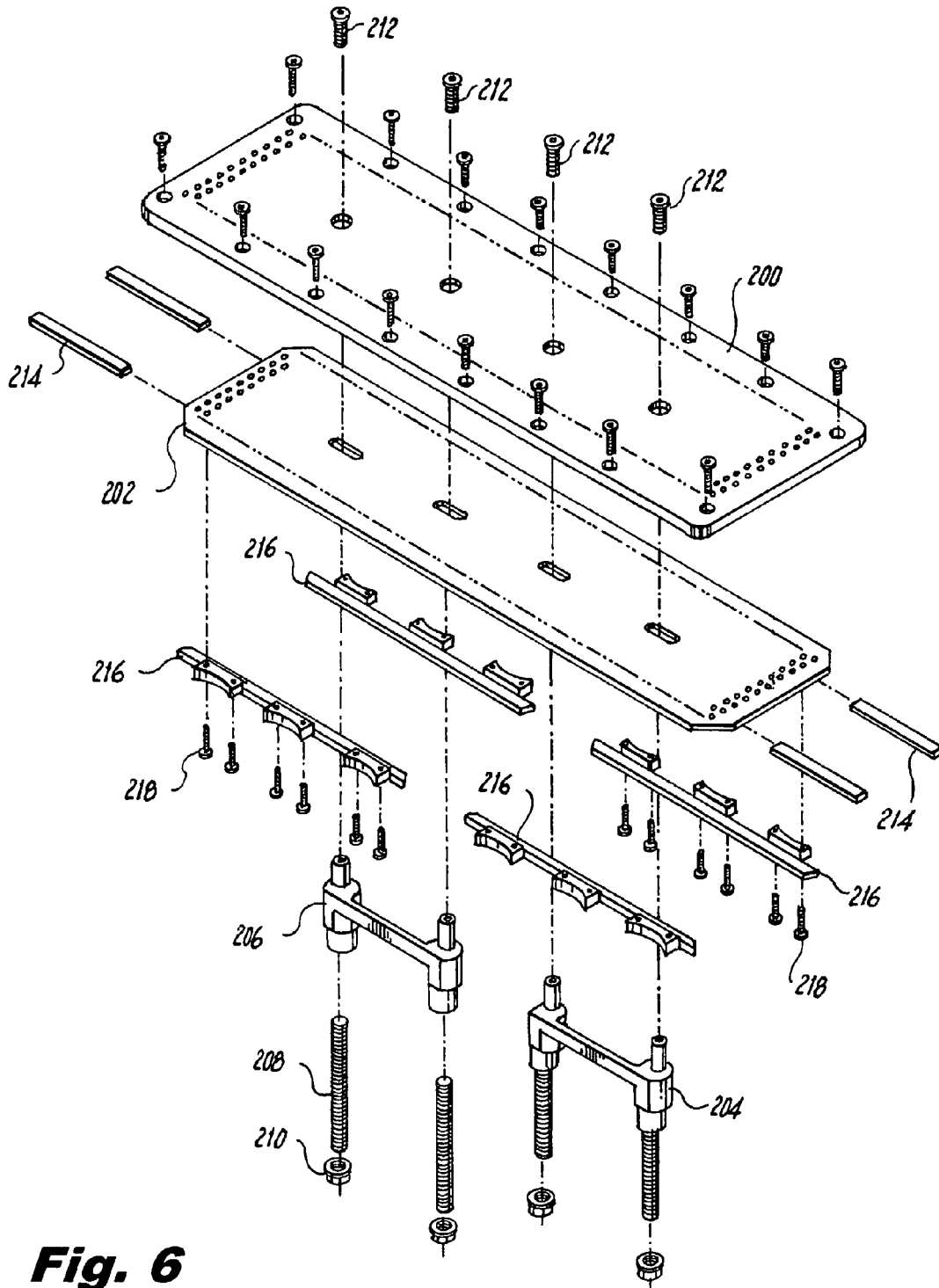
**Fig. 2**



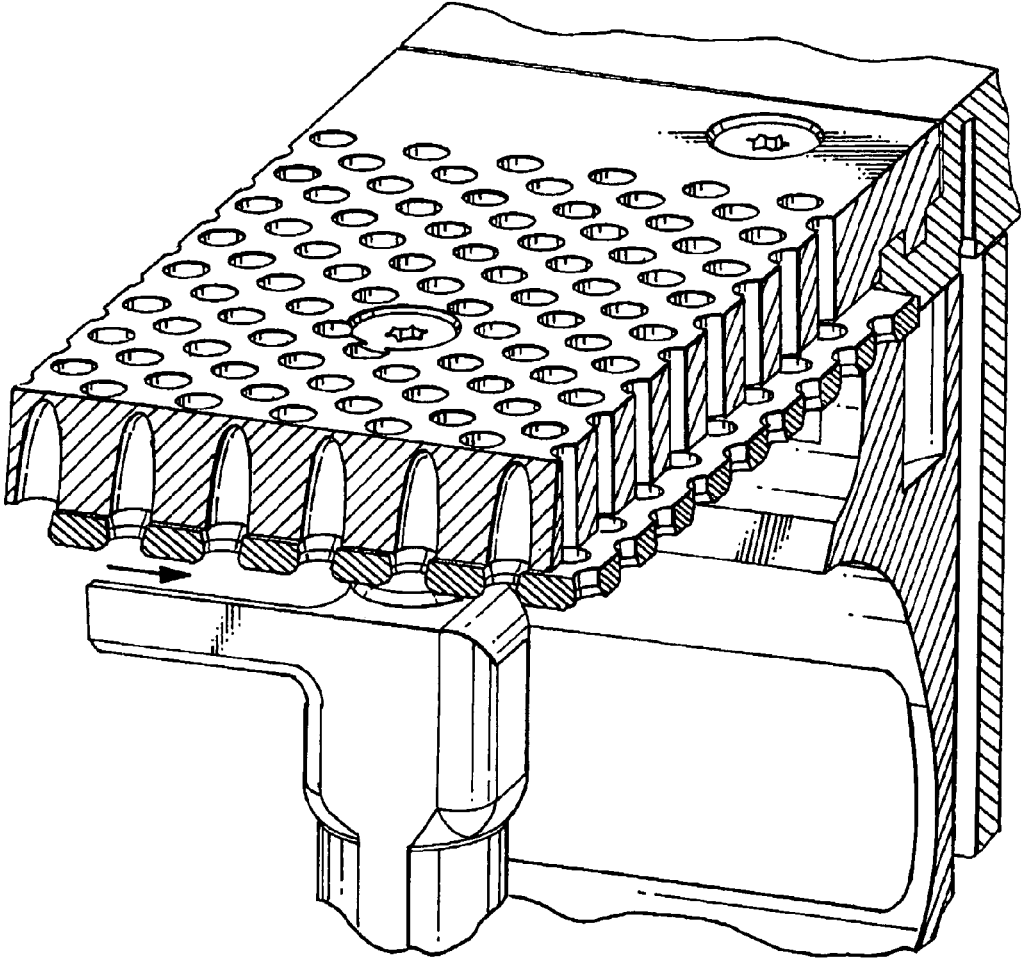
**Fig. 3**



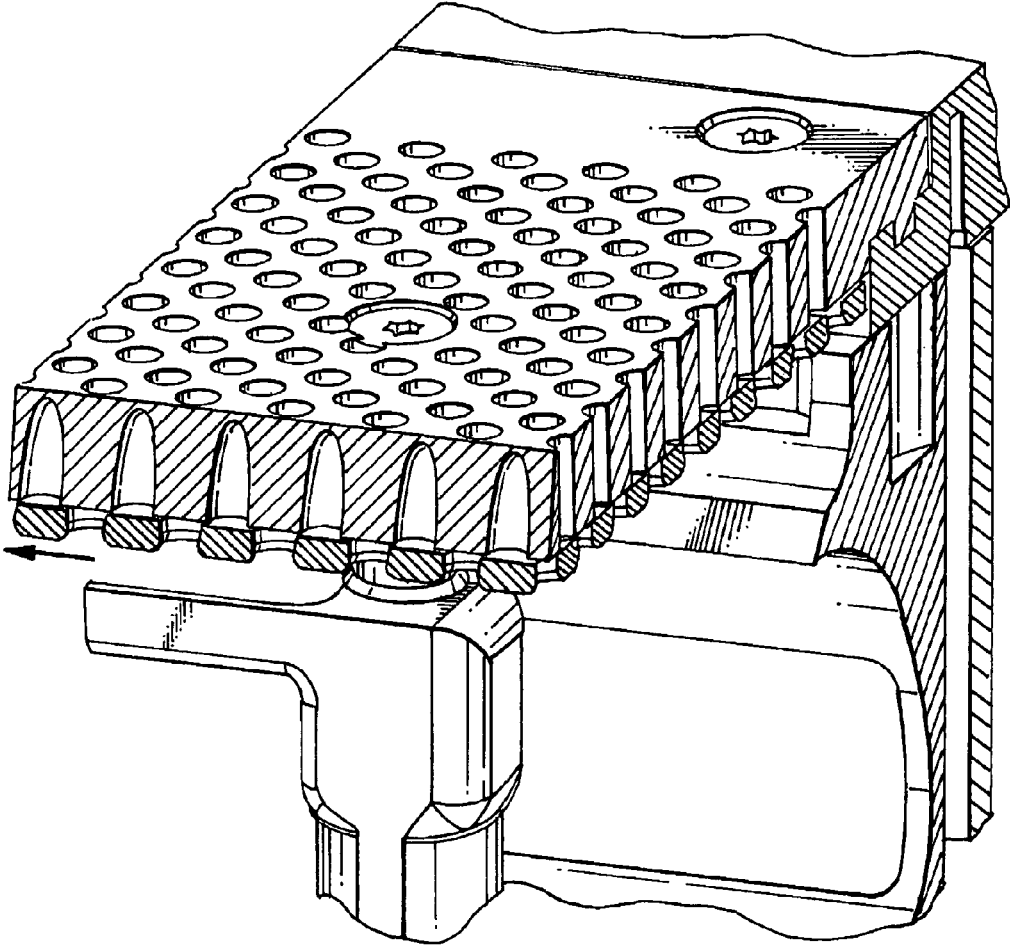
**Fig. 5**



**Fig. 6**



**Fig. 7**



**Fig. 8**

**FILL SYSTEM FOR FORMING MACHINES**

## FIELD OF THE INVENTION

The present invention relates to a hold-down tooling pack-  
age that maintains the dimensional integrity between the  
product manifold, shear and fill plate.

## BRIEF DESCRIPTION OF THE PRIOR ART

U.S. Pat. No. 4,043,002 relates to a patty machine for  
forming successive patties of a predetermined size from a  
quantity of bulk product. The machine includes a charging  
chamber in which the product is pressure-fed into a patty  
mold cavity by means of intermeshing, positive displace-  
ment, self-wiping compressor screws. The product is deliv-  
ered from a feed hopper to the entrance of the charging  
chamber by means of the conveyor screws which operate on  
a demand basis to convey the product to the compressor  
screws. Shafts for driving and supporting the conveyor and  
compressor screws extend throughout the length of the  
machine and each carries one conveyor and one compressor  
screw.

U.S. Pat. No. 7,591,644 relates to a counter-balanced mold  
plate for a food patty molding machine. The mold plate is  
used in a reciprocating mold plate that the forming apparatus  
which includes a flat body having a plurality of cavities for  
forming patties. The flat body has a fill side face and an  
opposite face. A grid pattern of grooves is formed on the  
second face extending longitudinally and laterally on the  
second face. The pattern extends a lateral distance that is  
equivalent to an overall cavity field width. Longitudinal  
and lateral slots that penetrate through a thickness of the mold  
plate and flow connect fill side pressure and meet with the  
pattern of grooves on the second face to balance the pressure  
on the opposite faces of the flat body.

U.S. Pat. No. 4,356,595 relates to an apparatus that  
includes a multi-orifice plate interposed in the outlet end of a  
fill passage extending from a food pump to a cyclically recip-  
rocating mold plate.

U.S. Pat. No. 4,371,008 relates to a multi orifice fill place  
and uses a stripped plate slidably mounted immediately adja-  
cent the fill plate. The stripper plate has fill openings that align  
one to one for the fill plate orifices when the stripper plate is  
in a fill location.

U.S. Pat. No. 4,821,376 relates to a food patty molding  
machine that comprises a multi-orifice fill plate interposed in  
the fill passage immediately adjacent the mold plate and a  
stripper plate.

## SUMMARY OF THE INVENTION

The present invention relates to a hold-down tooling pack-  
age that maintains the dimensional integrity between the  
product manifold, shear and fill plate.

The present invention relates to a hold down design used on  
standard fill plates. The hold down assembly prevents flexing  
of the fill plate and shear plate and fill plate that can cause  
performance and wear like problems in the tooling.

The present invention relates to a hold-down tooling device  
comprising: a space keeper placed around a shear plate and  
below a fill plate; and a hold down device placed within said  
fill plate and a hold down assembly center support. The device  
is placed within a product manifold.

It is an object of the present invention for the device to  
prevent flexing of the fill plate and the shear plate.

It is an object of the present invention for the device to  
prevent the fill plate from having any spaces or gaps with the  
shear plate.

The present invention relates to a hold down tooling device  
comprising: a fill assembly with a center hold down compris-  
ing a fill plate; a shear plate and center supports. The center  
supports comprise a mounting stud and nut. The center sup-  
port is connected to the shear plate and fill plate. Space  
keepers are attached to the fill plate.

It is an object of the present invention to improve shearing.  
It is an object of the present invention to decrease clogging.  
In the prior art with traditional tooling, the fill plate flexes  
which causes clogging. In the present invention, flatness of  
the fill plate is maintained by the hold down assembly of the  
present invention.

It is an object of the present invention to maintain the  
flatness of the fill plate and shear plate so that the cutting edge  
stays true and sharp edges maintain their proximity to each  
other.

It is an object of the present invention to improve product  
fiber cutting.

It is an object of the present invention to improve product  
fiber column definition.

It is an object of the present invention for the former to be  
able to cycle with less product pressure required to fill cavi-  
ties.

It is an object of the present invention to have less drag on  
the mold plate at higher strokes per minute.

It is an object of the present invention to have a longer  
tooling life.

It is an object of the present invention to eliminate mold  
plate chattering. Mold plate chattering is eliminated because  
there is less drag from the dimensional integrity of the system  
of the present invention.

It is an object of the present invention to provide soft  
textured products without sacrificing machine performance.

The present invention relates to a method for producing  
food patties. Augers bring meat into a pump box. Plungers  
push the meat into a manifold while other plungers are being  
filled. The product that is pushed into the manifold has trem-  
endous pressure. The shear plate obstructs holes in the fill  
plate. The shear plate moves to line up holes in the shear plate  
with holes in the fill plate. When closed, the product cannot go  
to the mold plate. The hold down assembly counteracts the  
pressure stated above. The hold down assembly counteracts  
pressure when the device is open or closed. The above method  
maintains dimensional integrity. The flatness of the device  
improves the shearing process. This creates better columns in  
the food patties.

The present invention relates to a method for filling a mold  
plate with product comprising: moving a shear plate beneath  
a fill plate transverse to the mold plate. The shear plate and fill  
plate are held with a hold down assembly. The mold plate is  
filled with product. The shear plate is moved to a closed  
position and the product is sheared.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a fill plate flexing with a traditional tooling  
setup.

FIG. 2 shows the fill plate having the hold down assembly  
of the present invention.

FIG. 3 shows the device of the present invention with the  
product manifold

FIG. 4 shows the keeper/spacer of the present invention.

FIG. 5 shows the hold down assembly center support of the  
present invention.

3

FIG. 6 shows the fill assembly and hold down assembly of the present invention.

FIG. 7 shows a cross sectional view of the shear plate of the present invention in the open position.

FIG. 8 shows a cross sectional view of the shear plate of the present invention in the closed position.

DETAILED DESCRIPTION

FIG. 1 shows the fill plate 10 flexing on a traditional tooling setup showing a gap 12.

FIG. 2 shows a fill plate 20 having no space 22 or gap showing.

FIG. 3 shows the fill plate 100 above the shear plate 102. The shear plate space keeper 104 keeps the shear plate and fill plate from allowing any gaps. The hold down screw 106 increases the fill plate 100 flatness while allowing the shear plate 102 to shift. The hold down screw 106 is kept within the hold down assembly center support 108. The entire device is placed within the product manifold 110.

FIG. 4 shows the spacer/keeper 104.

FIG. 5 shows the hold down assembly center support 108.

FIG. 6 shows a fill assembly with a center hold down comprising a fill plate. A fill plate 200, a shear plate 202, having center supports 204 and 206. The center support having a mounting stud 208 and a hex nut 210. The center support 204 and 206 are connected to the fill plate 200 by a fill insert screw 212. Pin dowels 214 push shear plate 202 in reciprocal motion. The space keepers 216 are attached to the fill plate 200 by hex screws 218.

What is claimed is:

1. A hold-down tooling device comprising:  
a space keeper on a shear plate and below a fill plate;  
a hold down device placed within said fill plate and a hold down assembly center support.
2. The device of claim 1 wherein said device is placed within a product manifold.

4

3. The device of claim 2 wherein said device maintains dimensional integrity between said product manifold, said shear plate and said fill plate.

4. The device of claim 1 wherein said device prevents flexing of said fill plate and said shear plate.

5. The device of claim 1 wherein said device improves shearing.

6. The device of claim 1 wherein said device decreases clogging.

7. The device of claim 1 wherein said device maintains flatness of said fill plate.

8. The device of claim 1 wherein said device maintains flatness of said fill plate and said shear plate so that a cutting edge stays true and sharp edges maintain their proximity to each other.

9. The device of claim 1 wherein said device improves product fiber cutting.

10. The device of claim 1 wherein said device improves product fiber column definition.

11. The device of claim 1 wherein said device creates less drag on a mold plate at higher strokes per minute.

12. The device of claim 1 wherein said device creates a longer tooling life.

13. The device of claim 1 wherein said device eliminates mold plate chattering.

14. The device of claim 13 wherein said device eliminates mold plate chattering by creating less drag from a dimensional integrity of system.

15. The device of claim 1 wherein said device provides that said fill plate has no space or gap with said shear plate.

16. A hold down tooling device comprising:  
a fill assembly with a center hold down comprising a fill plate; a shear plate and center supports;  
said center supports having a mounting stud and nut;  
said center support connected to said shear plate and fill plate;  
space keepers attached to said shear plate.

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