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(54) **COMPACT JUICER**

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CPC A47J 19/027; A47J 19/02; A47J 19/06; A47J 37/0835; A23N 1/00; B25G 1/00
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See application file for complete search history.

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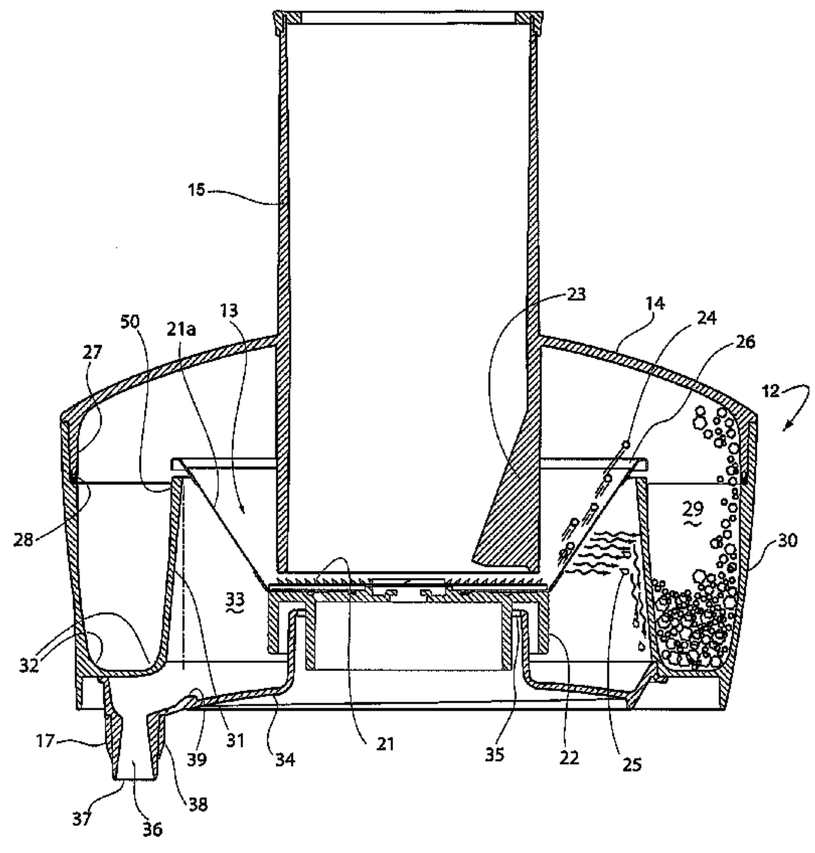
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(57) **ABSTRACT**

A fruit and vegetable juicer has a motor above which is a filter basket that is surrounded by a collection chamber. A feed tube is supported above the filter basket and is integral with a lid to the collection chamber. In preferred embodiments, the separation chamber comprises a central liquid collection portion and a pulp collection portion that surrounds it. In particularly preferred embodiments, the inside diameter of the interior sidewall that separates the pulp collection chamber from the juice collection chamber is tapered toward a central axis of rotation. The smaller diameter end of the sidewall is adjacent to an upper rim of the filter basket.

15 Claims, 4 Drawing Sheets



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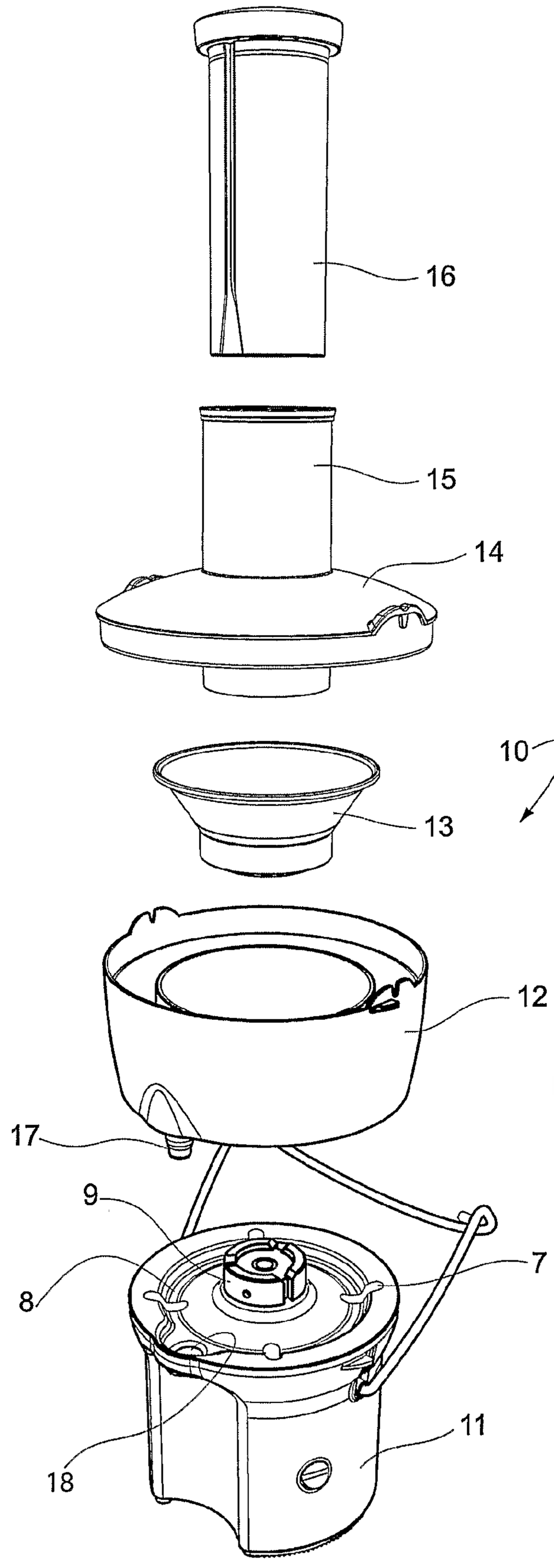


Fig. 1

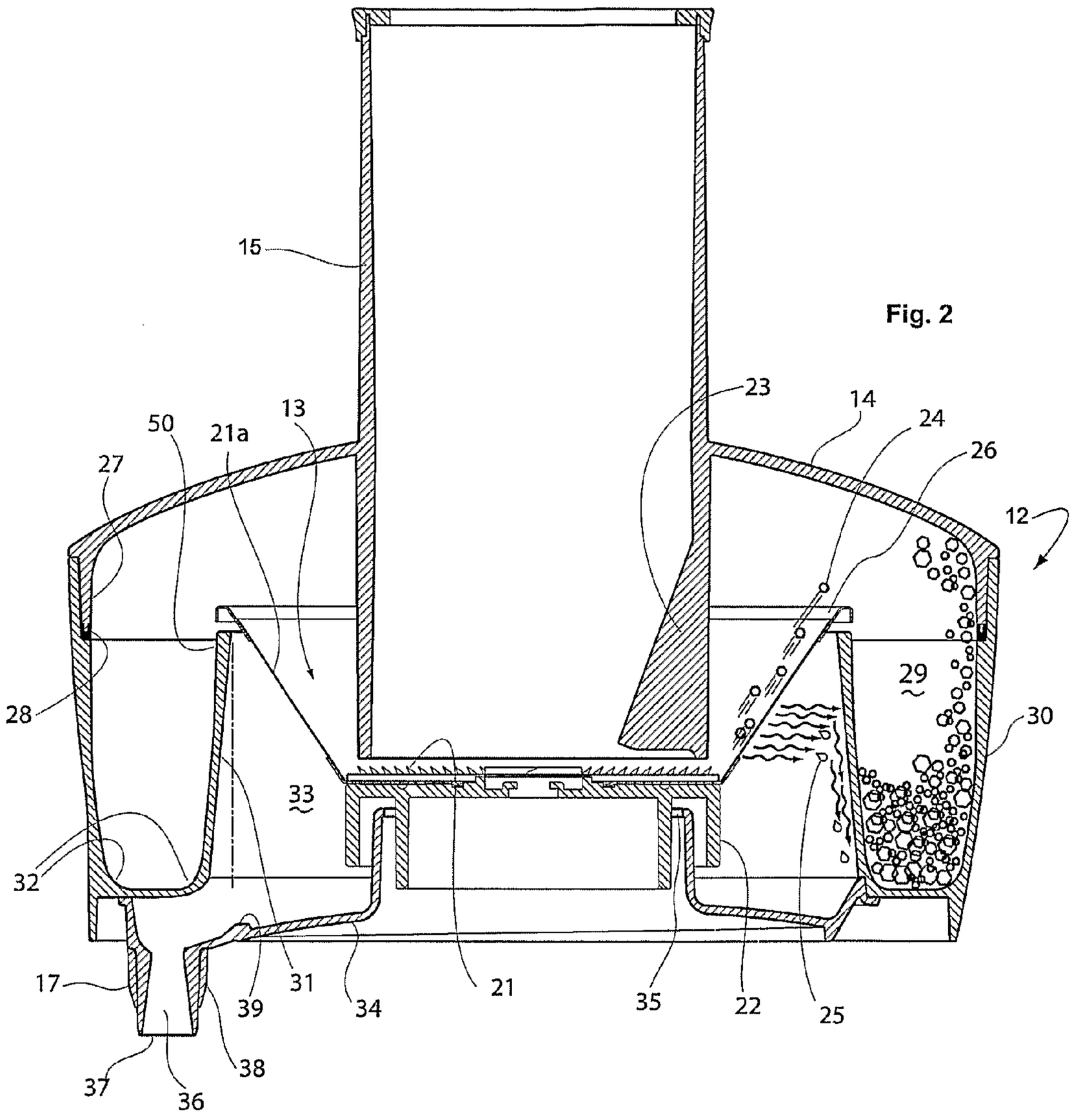

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Fig. 2

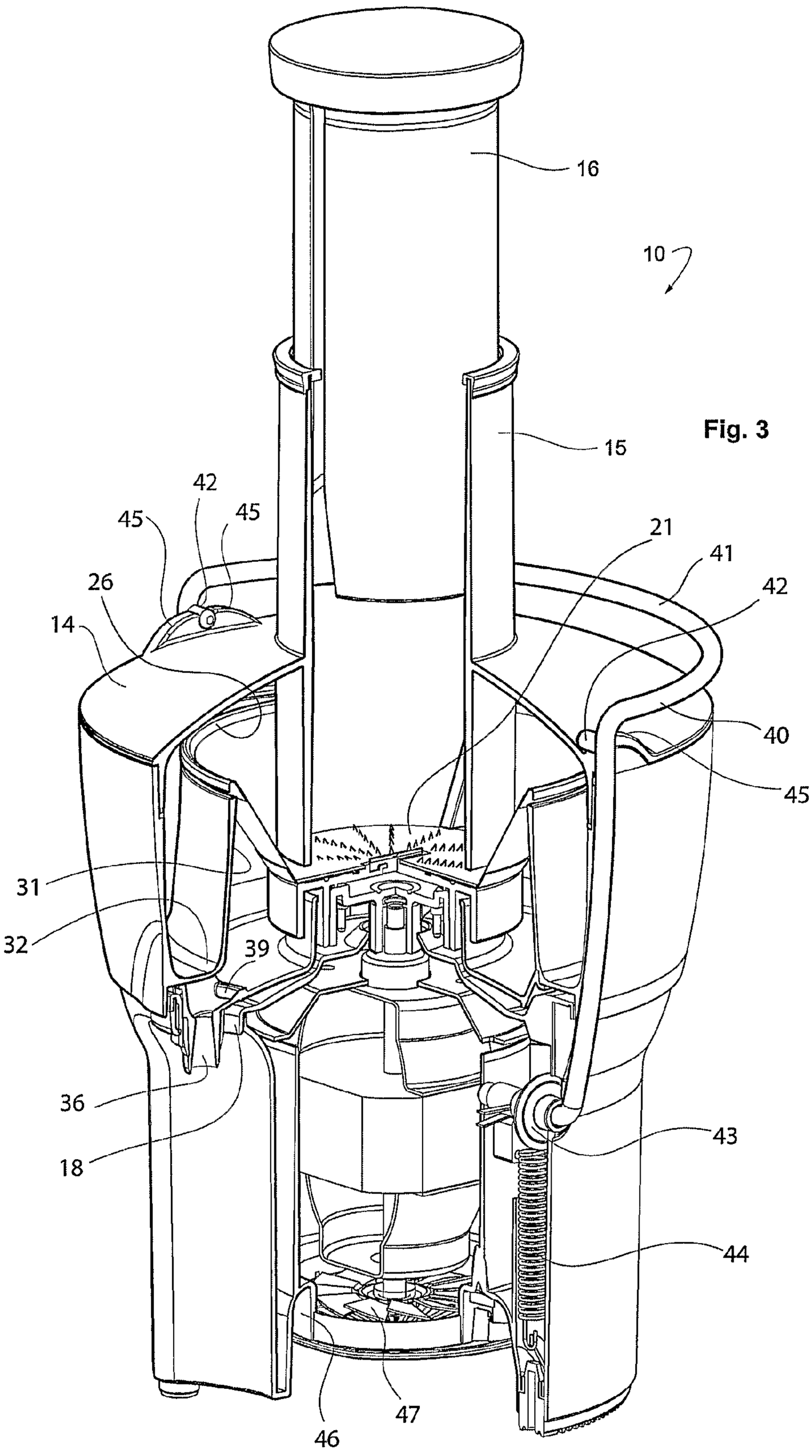


Fig. 3

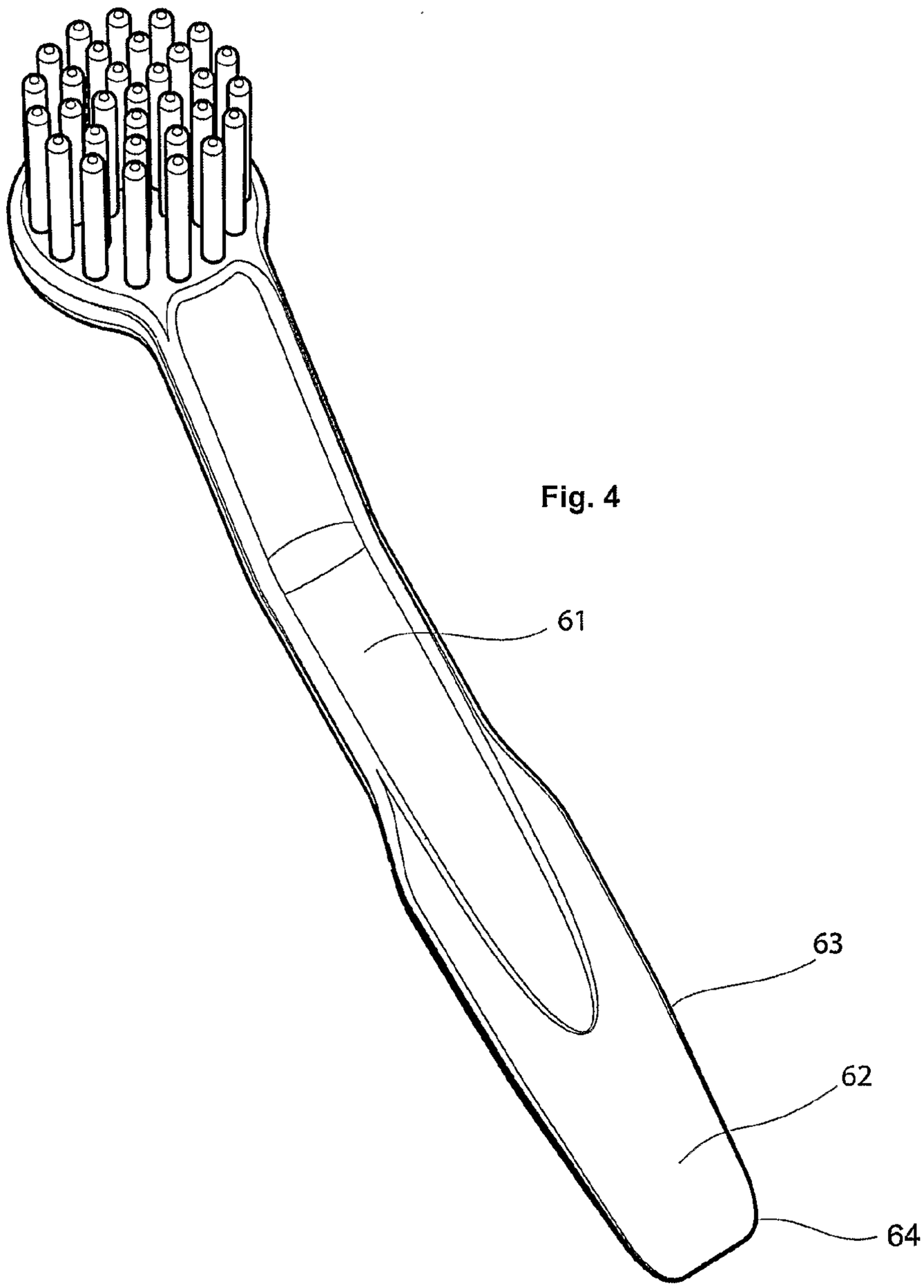


Fig. 4

COMPACT JUICER

FIELD OF THE INVENTION

The invention pertains to fruit and vegetable juicers and more particularly to a compact juicer with a full size feed tube.

BACKGROUND OF THE INVENTION

Fruit and vegetable juicers are well known. Such devices appear in a variety of sizes depending upon factors such as build quality, juicing capacity and feed tube diameter. Whereas a juicer with a larger footprint may be accepted in some domestic settings and commercial settings, it would be desirable to have a compact juicer primarily for domestic use that had the characteristics of its larger counterparts.

OBJECTS AND SUMMARY OF THE INVENTION

It is an object of the invention to provide a compact fruit and vegetable juicer that utilises a full size feed tube.

It is another objection of the invention to provide a juicer with internal juice flow characteristics that were optimised for facilitating clean up and minimising spillage.

Accordingly, there is provided a fruit and vegetable juicer having a motor above which is a filter basket that is surrounded by a collection chamber. A feed tube is supported above the filter basket and is integral with a lid to the collection chamber. In preferred embodiments, the diameter of the feed tube is substantially the same as the diameter of the grating disk of the filter basket.

In some preferred embodiments, the separation chamber comprises a central liquid collection chamber and a pulp collection chamber that completely surrounds it.

In particularly preferred embodiments, the inside diameter of the tubular interior sidewall that separates the pulp collection chamber from the juice collection chamber is tapered toward the central axis of rotation. The smaller diameter end of the sidewall is adjacent to an upper rim of the filter basket.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred aspects of the technology will now by described, by way of example only, with reference to the accompany drawings in which:

FIG. **1** is an inline for assembly view of an embodiment juicer appliance or apparatus;

FIG. **2** is a partial sectional view of the embodiment juicer appliance of FIG. **1**, showing a collection chamber having an inner juice collection portion and an outer pulp collection portion;

FIG. **3** is a partial cutaway perspective view of the embodiment juicer appliance of FIG. **1**; and

FIG. **4** is a perspective view of an embodiment cleaning tool for a juicer appliance.

BEST MODE AND OTHER EMBODIMENTS OF THE INVENTION

As shown in FIG. **1**, a compact fruit and vegetable juicer **10** comprises a motorised base **11** above which is received a collection chamber **12**. The base has an upper surface that includes a central mote **8** that is adapted to receive cooperating features formed into the bottom of the collection chamber **12**. Elastomeric pads **7** dampen vibration between the base **11**

and the chamber **12**. The mote **8** leads to, flows into and includes an opening **18** through which extends the chamber's spout **17**.

A removable filter basket and grater **13** resides within the collection chamber and is accessible to the base's drive spindle **9** through an opening in the floor of the collection chamber **12**. The collection chamber **12** is covered by a lid **14** that includes a full size feed tube **15** being about 65 mm-85 mm and preferably 75 mm in internal diameter. A pusher **16** co-operates with the feed tube **15** to urge the contents of the feed tube toward the grating disk of the filter basket **13**. As will be explained, the generally toroidal collection chamber **12** is sub-divided into two nested and preferably concentric portions. One radially outer portion serves the purpose of collecting pulp discharged by the filter basket **13**. The other radially inner portion collects extracted juice and discharges if through the spout **17**. By locating the pulp and juice collection chamber **12** and spout **17** essentially above the base **11**, the "footprint" of the juicer **10** (for a given motor size) is optimized. A single essentially cylindrical wall is shared by the pulp and juice collection chambers and separates these two portions.

As shown in FIG. **2**, the filter basket **13** further comprises a frusto-conical sieve **21***a* that is joined to a grating disk **21**. Both the sieve **21***a* and the disk **21** are joined to a coupling **22** that is driven by the output spindle **9** of the base **11**. When the lid **14** is closed, the feed tube **15** is located above and in registry with or preferably but not necessarily concentric with the grating disk **21**. The feed tube **15** is also characterised by an internal anti-rotation knife **23**. Note that the internal diameter of the feed tube **15** is approximately the same as (or marginally smaller than) the maximum effective or useful diameter of the grating disk **21**.

As shown on the right hand side of FIG. **2**, food matter urged toward the grating disk **21** by the pusher **16** is reduced to pulp **24** and juice **25**. Droplets of juice **25** are able to pass through the expanded metal mesh that forms the sieve of the filter basket **13**. Pulp particles are unable to pass through the sieve and are therefore ejected above the rim **26** of the filter basket **13**. It is inevitable that a certain amount of juice is carried by the ejected pulp. Because it is possible for positive air pressure to develop inside of the collection chamber, the seal between the lid **14** and the base of the collection chamber **12** may be improved by providing an elastomeric bead or tip **28** in the area of the lid's seal with chamber's outer wall **30**. In this example, the lid's descending rim **27** is provided with a circumferential elastomeric tip **28** that inhibits the migration of juice from the seam between the removable lid **14** and the collection chamber **12**.

As illustrated in FIG. **2**, the collected pulp particles **24** will accumulate in the toroidal zone **29** that is defined by the generally cylindrical outer wall **30** of the collection chamber **12** and the chamber's generally cylindrical inner wall **31**. Note that for ease of cleaning, the inner and outer corners **32** at the bottom of the pulp collection area **29** are rounded.

The internal juice collection portion **33** of the collection chamber **12** is defined by the underside of the sieve **13**, the interior of the inner wall **31** and (in this example) a separately moulded floor **34**. The floor **34** is preferably sealed to the underside of the chamber, for example, by ultrasonic welding. As shown in FIG. **2**, the floor is joined to and edge-sealed against the underside of the main body of the collection chamber **12**. The floor includes a central opening **35** so that the coupling **22** can engage the spindle **9** (not shown). In this example, the discharge spout **36** is located radially outward at a point that corresponds approximately to mid-way between the inner and outer walls **30**, **31** of the pulp collection chamber

12. The discharge nozzle **36** is tapered so that the diameter of the opening increases progressively toward the terminal discharge opening **37**. Note that because the nozzle passes through an opening **18** in the base (see FIG. **1**), a soft polymer sleeve **38** encircles the nozzle **36** to minimise noise associate with normal vibration that occurs during use. The separately moulded floor **34** allows the outer wall **31** or separating wall **31** to be moulded with a draft or taper that would otherwise not be practical to manufacture.

The spout is aligned essentially vertically so as to discharge downwardly. The discharge nozzle **36** is also optionally associated with a small internal dam **39**. The dam rising above the floor **34** inhibits the movements of smaller quantities of extracted juice towards the nozzle. This feature thus prevents prolonged dripping. The tapered nozzle shape encourages a swirling motion of the juice flowing through the nozzle and thus minimises spattering and splashing during discharge.

As shown on the left hand side of FIG. **2**, the inside wall (separating wall) **31** of the juice collection chamber is tapered or inclined with respect to the vertical. As shown, the upper rim **40** of the inside wall **31** is closer to the centre of the juicer than the lower edge or base of the wall. It has been observed that inclining the separating wall **31** so that it narrows in diameter at the top helps improve the flow of juice toward the floor **34**. The taper assists the juice within the juice collection portion **33** to flow toward the floor and therefore toward the nozzle rather than toward the gap between the upper rim **40** of the inner wall **31** and the rim **26** of the filter basket. As previously mentioned, the provision of a separately moulded floor and mechanically bonded (sealed) floor is necessitated primarily by manufacturing constraints associated with the negative draft angle created along the interior surface of the inside wall **31**.

Note that the upper rim or extremity **50** of the inside wall **31** is strengthened by it being slightly thicker than the remaining section of the inner wall. The upper extremity **50** is also in registry with the upper or outer rim **26** of the filter basket.

As shown in FIG. **3**, the lid **14** is secured, during operation, by a safety bar **40**. The safety bar comprises a generally semi-circular upper portion **41** that carries a pair of inward facing and opposed pins **42**. The lower ends of the safety bar **40** are carried by polymeric bushings **43**. The entire bar **40** has a limited range of vertical motion but is urged into a downward position by a pair of internal tension springs **44**. Note that the lid **14** is generally symmetrical and can thus be mounted in two orientations with respect to the safety bar **40**. Thus, when the lid is closed, the pins **42** can ride up either of the symmetrically opposed ramps **45** (depending on which way the lid is oriented), eventually coming to rest in a detent that is located between the ramps. An internal portion of the safety bar **40** is mechanically interconnected with a cut-out switch so that the motor can only be operated when the safety bar **40** is fully upright, that is, in the orientation depicted in FIG. **3**. FIG. **3** also illustrates that the underside of the juicer **10** comprises an electrical cord storage space **46** that surrounds the inlet duct **47** associated with the motor's cooling fan.

As shown in FIG. **4**, a specially configured brush may be provided with or as a separate component to the juicer **10**. The brush **60** has a round head attached to an integral handle **61** that is angled, matching the cone angle of the sieve, so as to facilitate cleaning of the grating disc. The end of the handle **62** is blade-like and has tapering wings or sides **63** that flare out from the shank of the handle and conform closely to the cross sectional shape of the pulp compartment **29**. Note that the bottom corners **64** are shaped to fill and conform to the rounded corners **32** at the bottom of the pulp compartment **29**. The end **62** is adapted to scrape the interior walls of the pulp compartment without scratching it.

While the present invention has been disclosed with reference to particular details of construction, these should be understood as having been provided by way of example and not as limitations to the scope of spirit or the invention.

What is claimed is:

1. A juicer comprising:

a motorised base having an upper surface from which protrudes a drive spindle, the upper surface adapted to receive a collection chamber;

the collection chamber having a spout; the collection chamber further having a lid with a feed tube; the collection chamber being removably located on the base and having a central opening for admitting the drive spindle;

a frusto-conical filter basket residing within the collection chamber, below the feed tube;

the collection chamber having an outer wall and a base; an internal dividing wall defines two nested portions within the collection chamber, being an outer pulp collection portion and an inner juice collection portion; the spout is in fluid communication with the inner juice collection portion; the outer pulp collection portion is in the form of a substantially annular trough between the outer wall and internal wall that is located around the inner juice collection portion;

wherein the internal wall is common to the two nested portions and encircles the inner juice collection portion; and an inner surface of the internal wall is tapered or inclined with respect to the vertical, such that the internal wall is closer to the axis of rotation of the filter basket at an upper extremity of the internal wall than at the base of the internal wall.

2. The juicer of claim **1**, wherein:

the upper extremity of the internal wall is thicker than a remainder of the internal wall.

3. The juicer of claim **1**, wherein:

a rim of the filter basket is in registry with the upper extremity of the internal wall.

4. A juicer of claim **1**, wherein:

the collection chamber has a floor that is separately molded and affixed about the underside of the collection chamber.

5. The juicer of claim **1**, wherein:

the nested portions are separated by the single shared internal wall.

6. The juicer of claim **1**, wherein:

the chamber has a lid, the lid having a descending rim provided with a circumferential sealing tip that is elastomeric.

7. The juicer of claim **1**, wherein:

the feed tube is about the same diameter as a grafting disk that is located below it within the chamber.

8. A juicer comprising:

a motorised base having an upper surface from which protrudes a drive spindle, the upper surface adapted to receive a collection chamber;

the collection chamber having a spout; the collection chamber further having a lid with a feed tube; the collection chamber being removably located on the base and having a central opening for admitting the drive spindle;

a frusto-conical filter basket residing within the collection chamber, below the feed tube;

the collection chamber having an outer wall and a base; an internal dividing wall defines two nested portions within

the collection chamber, being an outer pulp collection portion and an inner juice collection portion; the spout is in fluid communication with the inner juice collection portion; the outer pulp collection portion is in the form of a substantially annular trough between the outer wall and internal wall that is located around the inner juice collection portion;

wherein the two nested portions are separated by the single shared internal wall, and an inner surface of the internal wall is tapered or inclined with respect to the vertical, such that the internal wall is closer to the axis of rotation of the filter basket at an upper extremity of the internal wall than at the base of the internal wall; and

wherein the inner collection portion having a separately molded floor that is affixed about the underside of the collection chamber.

9. The juicer of claim **8**, wherein:

the floor has formed in it a vertical discharge spout.

10. The juicer of claim **8**, wherein:

the discharge spout is adapted to pass through an opening formed in an upper surface of the base.

11. The juicer of claim **8**, wherein:

the discharge spout is tapered, the internal diameter increasing toward a terminal discharge opening.

12. The juicer of claim **8**, wherein:

the discharge spout is located radially within an outer wall of the chamber.

13. The juicer of claim **8**, wherein:

the lid has a descending rim provided with a circumferential sealing tip that is elastomeric.

14. The juicer of claim **8**, wherein:

the feed tube is about the same diameter as a grating disk that is located below it within the chamber.

15. The juicer of claim **8**, wherein the inner surface of the internal wall is continuously tapered with respect to the vertical.

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