

Appendix B – Obviousness Chart for U.S. Patent No. 10,858,177

U.S. Patent No. 10,858,177	Disclosure
	<p>The discharge cycle has four main stages, not all of which are used for all beverage types:</p> <ul style="list-style-type: none"> (i) Pre-wet (ii) Pause (iii) Brew/Mixing (iv) Purge <p>In the pre-wet stage the cartridge 1 is charged with water from the water storage tank 220 by means of the water pump 230. The charging with water causes the beverage ingredients 200 in the filtration chamber 130 to be wetted.</p> <p>Panesar at p. 37, ll. 17–24:</p> <p>In the brew/mixing stage water is passed through the cartridge 1 in order to produce the beverage from the beverage ingredients 200. The temperature of the water is determined by the control processor which sends instructions to the water heater 225 to heat the water passing from the water tank 220 to the brew head 250. Water enters the lower part 255 of the holder 251 through the conduit 262 via the inlet valve and the inlet piercer 253 into the inlet chamber 25 126 of the beverage cartridge 1.</p> <p>Rossi at Abstract:</p> <p>The process for controlling the operation of an edible-product making machine (1) of the type being fed with a single use load element (2) having a brewable or water soluble aromatic substance (3) for preparation of the edible product, comprises a first step of recognition wherein the edible-product making machine (1) recognises an identifying element (4) on the load element (2) allowing the edible-product making machine (1) to take further steps only if it also recognises on the load element (2) a validation element (5) to be validated, a second step of validation of the validation element (5), and a third step of activation wherein the edible-product making machine (1) automatically activates a cycle of production of the edible product only after having recognised on the load element (2) the identifying element (4) in combination with the validation element (5) as validated.</p>

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	<p>Rossi at 5-6:</p> <p>The use of a validation element and validation means, as well as the step allowing the machine to take further steps only if it also recognises on the load element the validation element help to prevent the use of an already-used single use load element in the machine, thereby avoiding the production of an edible product of inferior quality and ensuring the proper functioning of the machine. In the case of re-use of a load element originally containing a water soluble aromatic substance, the dynamics of the fluid flow through the machine could be different if there is no substance in the load unit for the water to contact, thereby causing incorrect functioning of the machine and the associated health hazard. The use of an activation step of automatically activating the cycle of edible-product production only when the same identifying element is recognised in combination with the validated validation element ensures that the operating conditions actually used are the correct conditions as selected by the machine in the first recognition step. This helps to prevent the user from making the mistake of inserting into the machine a different load element to the one that was first recognised, for which the operating conditions are set.</p> <p>Rossi at 7:</p> <p>The edible-product making machine is only allowed to take further steps if it in the first step also recognises on the load element a validation element to be validated. In practice, this may take the form of unlocking the machine when both the identification element and the unvalidated validation element are recognised. Thus, the production process cannot be activated unless the first step has been completed. The process could also require that the validation element be of a specific kind or be related to or associated to the identification element in a specific way in order for this first step to be completed. The validation element could be identical to the identification element, but is preferably different thereto, and could either be either of the same or of a different type to the identification element. If the identification element and the validation element are of different types, the recognition means for the two must accordingly also be different.</p>

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	<p>Rossi at 8:</p> <p>In a third step of the process, the product-making machine automatically activates a cycle of edible-product production. However, this is only after having recognised on the load element the same identifying element as that recognised in the first step, and it must be recognised in combination with the validation element as validated. As with the first and second steps, this step may take place inside or outside the machine. However, for reasons of cost efficiency, it is preferable to use the same recognition means in step three as in step one.</p> <p>Rossi at 9-10:</p> <p>The system further optionally comprises checking means connected to a control unit of the machine. This may be in the form of a computer programme within the control unit. The checking means compares the signal from the recognising means for the identifying element and the validation element with pre-stored data in order to allow the machine to proceed to activation only if it recognises the identifying element and the unvalidated validation element. The checking means may be connected to unlocking means for unlocking the machine when said recognition takes place.</p> <p>Rossi at 10:</p> <p>Figure 1 shows a schematic view of one embodiment of the system of the present invention.</p> <p>With reference to the above figure, the system comprises an edible-product making machine 1 and a single use load element in the form of a capsule 2. The load element contains a brewable or water soluble aromatic substance 3 for preparation of an edible product. The capsule 2 comprises an identifying element in the form of a barcode 4 and a validation element also in the form of a barcode 5, both located externally on a protective sheet 6 of the outlet base of the capsule. The machine 1 comprises recognising means in the form of an infrared barcode reader 7. This is connected to checking means 8 stored within a control unit 9 of the machine. The checking means allow the machine activation means 10 to be engaged only if the barcode reader 7 recognises the identification barcode 4 and the validation barcode</p>

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	<p>5. The machine 1 further comprises validation means in the form of a mechanical tool 11 having a plurality of tips for destroying the validation barcode 5, for example by ripping, cutting, scratching or piercing, such that the barcode reader 7 cannot recognise it as an unvalidated validation barcode. If, after the positive signal from the checking means 8 from the first recognition of the identification and validation barcodes 4,5, the barcode reader 7 performs a second recognition of the identification barcode 4 combined with the validated validation barcode 5, the activation means 10, connected to the barcode reader 7 through the control unit 9, automatically activate a cycle of production of the edible product.</p> <p>Rossi at Claims 1, 13.</p> <p>Yoakim at [0025]:</p> <p>The device is useful for preparing beverages from a plurality of different capsules, in which case it further comprises identification means for identifying the different capsules, and control means capable of operating the device in centrifugation for any of the different capsules according to predetermined liquid food preparation parameters including the flow rate and the volume of liquid to be injected into the capsule, with the identification means comprising capsule recognition means which are recognized by sensing means connected to the control means of the device to control the preparation parameters accordingly.</p> <p>Yoakim at [0192]:</p> <p>Therefore, as much as two, three, four or even more different flow rates and/or speed ranges can be provided in function of the types of coffee to be delivered. Therefore, depending on the types of beverage to be brewed, the control unit can be programmed to adjust the optical centrifugal conditions. For instance, the control unit may be associated to a capsule recognition system enabling to recognize the types of capsules, i.e., espresso, lungo, cappuccino, long coffee (e.g., 180-400 ml), latte, tea, etc., and to adjust the speed and/or other brewing parameters (e.g., water temperature) according the capsule which is inserted in the device. A recognition system uses a code on the capsule and recognized by the device, such as a color, a</p>

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	<p>barcode, an RFID, a magnetic code, ferromagnetic micro-wires or labels, shapes and combinations thereof. Yoakim at [0477]:</p> <p>The capsule system further comprises an identification means associated to the different capsules in the set for identifying each capsule and adjusting brewing parameters accordingly. The adjustable parameters can be the rotational speed, the back-pressure at the outlet of the capsule, and/or the volume of liquid fed in the capsule. The identification means participates to deliver a wider range of beverages having differentiated characteristics (volume, taste, strength, crema, colour, etc.). The identification means are associated to control means placed in the centrifugal brewing device which controls the adjustment of the said parameters, by controlling the rotational motor driving the capsule holder or/and the pump supplying liquid in the capsule.</p>
<p>[1.g] wherein the base element has a wall region with an electrically conductive section</p>	<p>The below cited art discloses, either expressly or inherently, wherein the base element has a wall region with an electrically conductive section. <i>See, e.g.:</i></p> <p>Boyd at [0019]-[0021]:</p> <p>Although the present invention may be used in virtually any brewing machine, it is described herein for use in the context of machines such as those disclosed in U.S. Pat. No. 5,974,949 to Weber et al. and U.S. Pat. No. 6,035,762 to Ruckstuhl. Those patents disclose machines for brewing espresso using espresso packets in the form of filter capsules which are received through a funnel into a brewing chamber where water is passed through the filter capsule to produce an espresso beverage. The subject matter of each of these patents is incorporated herein by this reference.</p> <p>The invention also may be practiced in connection with espresso machines such as those disclosed in U.S. Pat. Nos. 4,253,385, 4,254,694, 4,353,293, 4,429,623, 4,484, 515, 4,555,894 and 4,852,333, all to Illy. These patents disclose various aspects of espresso machines which include brewing chambers configured to receive pre-fabricated espresso packets through which water is passed to produce an espresso drink. The subject matter of each of these patents also is incorporated herein by this reference.</p>

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	<p>While the aforementioned machines generally are described for use in connection with espresso packets which contain a single serving of espresso, it will be appreciated that the present invention considers application of the relevant principles to machines which employ coffee packets for use in brewing multiple cups, which employ coffee packets of various size and shape, which employ various filter media and which contain coffee of various varieties, roasts, and grinds. Furthermore, the packet and methodology described herein may also produce other types of beverages such as tea, cider, and/or any beverage which is produced by mixing various ingredients. The packet and methodology is not limited to hot beverages and may be used to produce cold beverages.</p> <p>Boyd at [0026]:</p> <p>Typically, the filter takes the form of opposing, water-permeable paper sheets, as indicated, but the filter may be formed of stainless steel, or some other filter material configured to define a cavity for containment of coffee grounds while water and brewed coffee beverage pass therethrough. It is desirable, however, that the filter impart no undesirable taste characteristics to the resulting coffee beverage.</p> <p>Jarisch at [0007]:</p> <p>Recognition means can comprise one or more strips of a magnetic material applied to the body of the package, which can be read by an appropriate magnetic sensor, one or more shaped or divided areas of metal foil applied to the package body which cause an inductive effect on movement of the package in the machine, which inductive effect can be sensed; or one or more electrically conductive areas formed on the body of the package which can be sensed electrically.</p> <p>Jarisch at [0093]-[0095]:</p> <p><u>4) Inductive code reading:</u></p>

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	<p>Another mode consists in sensing a code provided on a metallic surface of the capsule using an inductive sensor. The code is formed by reliefs or recesses in the metallic surface.</p> <p>Mahlich at [0005]:</p> <p>The single-serving capsules consist mostly of a deep-drawn plastic or aluminium foil and their advantage, when compared to pouches, lies in the fact that they have an air-tight seal and that certain manufacturers fill them with a protective gas containing the coffee aroma as well. Such pre-proportioned single-serving units are available for approximately 10 different coffee fillings. Due to this variety the consumer is able to stock smaller amounts of different types of coffee. In addition, the use of these single-serving units in conjunction with the special brewing heads of those espresso machines equipped to process such single-serving units results in a reliably constant optimum brew.</p> <p>Mock at [0026]:</p> <p>The packaging comprises a side wall, an end wall and a closure element comprising a welded seal.</p> <p>Mock at [0027]:</p> <p>The packaging according to the invention may be produced with very diverse shapes and in very diverse materials. It may be rigid, for example made of thermoforming plastic or stamping thin metal sheet, for example made of aluminum, and have an outline that is, for example, circular, rectangular or hexagonal.</p> <p>Yoakim at [0129]:</p> <p>The capsule can also comprise a cup-shaped body onto which the sealing lid is sealed. The cup-shaped body may also comprise gas barrier materials, such as metal, e.g., thin aluminium and/or plastic.</p> <p>Yoakim at [0215]:</p>

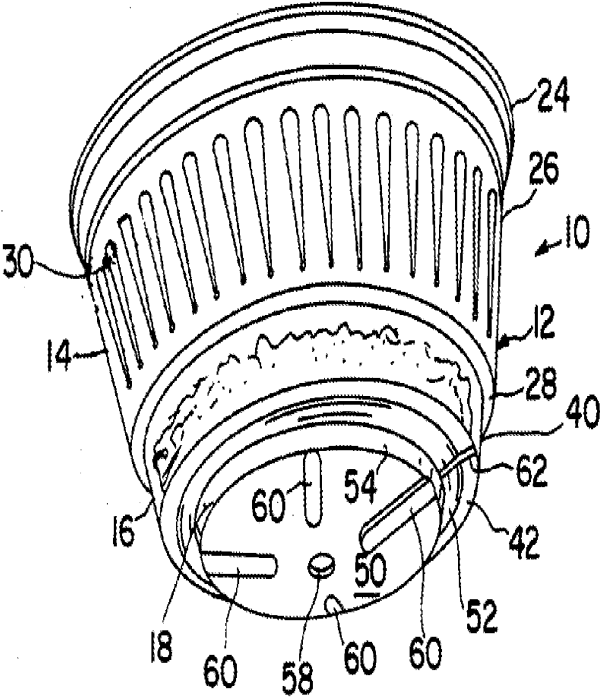
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	<p>The body of the capsule can be made of plastic and/or aluminium or aluminium alloy. For example, it can be moulded by injection of plastic or deep drawn in aluminium.</p> <p>Yoakim at [0461]:</p> <p>FIGS. 45 to 50 are other variants of capsules according to the invention. For example, the capsule of FIG. 45 has a cylindrical side wall 700, an upper wall 701 and a lower wall 702 both sealed or connected to the sidewall 700. The capsule is gastight by choosing materials for the walls, e.g., aluminium and/or suitable plastics, which have gas barrier properties.</p> <p><i>See also, e.g.</i> Yoakim at [0414].</p>
[1.h] and radially spaced and vertically oriented drawn grooves,	<p>The below cited art discloses, either expressly or inherently, radially spaced and vertically oriented drawn grooves. <i>See, e.g.</i>:</p> <p>Boyd at [0015]:</p> <p>FIG. 2 g is a fragmentary view of an alternative embodiment packet, illustrating encoded data in the form of grooves.</p> <p>Boyd at [0029]:</p> <p>Examples of alternative embodiments are depicted in FIGS. 2 b through 2 h. In FIG. 2b the feature is geometric shape 32. The shape may be raised or lowered and may, or may not incorporate color, or some other machine-interpretable characteristic. FIG. 2c shows text string 33. The text string may consist of alpha-numeric characters and may be of various lengths including a single character. FIG. 2d shows glyph 34. The glyph may be any symbolic figure including a symbol used as a trademark. A digital watermark 35 is depicted in FIG. 2e. FIG. 2f shows notches 36. The notches may be localized to a particular area of the packet or may span its entire perimeter in singular or repetitive fashion. Grooves 37 are depicted in</p>

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	<p>FIG. 2g. One or more grooves may be incorporated to create a texture. FIG. 2h shows holes. One or more holes may be used, which holes may be, of various shapes and sizes. The above-noted machine interpretable features; or other machine interpretable features, may similarly may be employed in combination or alone, such features being selected for their ability to store brewing directives and packet and/or ingredient-characteristic data, and for their cost of manufacture, aesthetic appearance, and ability to carry machine interpretal features which are capable of being successfully detected, read, and interpreted.</p> <p>Boyd at Fig. 2g:</p> <div style="text-align: center;">  <p>FIG. 2g</p> </div> <p>Erickson at 5:9-26:</p> <p>The reservoir 14 of the container 12 is open at the top and includes a rim 24, a depending side wall 26 and a bottom wall 28. The rim 24 extends laterally and outwardly from the upper end of the wall 26 to facilitate pouring of the water or other liquid into the reservoir and movement of the coffee maker 10 without spilling. The wall 26 is cylindrical and is stepped and tapered inwardly and includes vertical ribs 30 for strengthening. The bottom wall 28, in the illustrative embodiment, is in the form of an annular shoulder and includes a relatively large central opening 32. As illustrated, the reservoir 14 of the invention is configured to contain the appropriate amount of water necessary to brew the desired amount of coffee and</p>

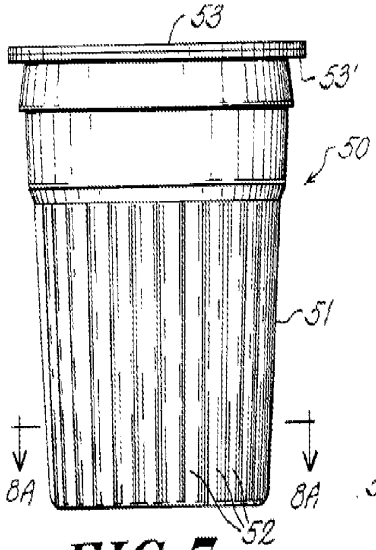
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	<p>to provide the necessary hydrostatic pressure to the partition 20 to cause the partition 20 to allow the flow of water therethrough at the desired brewing temperature.</p> <p>Erickson at Fig. 1:</p>  <p>FIG. 1</p> <p>Lazaris at [0028]:</p> <p>A typical beverage filter cartridge is depicted by 50 in FIGS. 7 and 8A. The cartridge includes a cup-shaped base 51 having an inverted frustum-shaped side wall interrupted by surface</p>

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	<p>irregularities indicated typically at 52 and comprising circumferentially spaced grooves. The cup-shaped base is closed by a lid 53. As herein employed, the term “surface irregularity” is intended to broadly encompass any deviation from a smooth surface than can mechanically interengage with adjacent components or surfaces of the housing 28. Non limiting examples of such surface irregularities may comprise a uniform array of grooves as shown in FIG. 8A, or pairs of oppositely disposed grooves 52 a in the side wall of a cartridge 50 a as shown in FIG. 8B, or a single surface irregularity such as the outwardly projecting rib 54 b in the side wall of cartridge 50 b as shown in FIG. 8C.</p> <p>Lazaris at [0039]:</p> <p>FIG. 6 illustrates an alternative embodiment of a cartridge holder in which the side wall of the housing 28 is provided with internal grooves 300" configured and arranged to slidably receive and coact in mechanical interengagement with externally projecting ribs 52 c in the side wall of cartridge 50 c Still another embodiment of a cartridge holder is illustrated in FIGS. 9-11. The cartridge 50 d is of the type described in the above-referenced patent application Ser. No. 09/782,660, with generally flat side walls diverging upwardly from a bottom to a top opening closed by a lid 53 a. Oppositely facing side walls are provided with surface irregularities in the form of protruding somewhat triangular-shaped bosses 52 d.</p> <p>Lazaris at [0041]:</p> <p>The recesses 301 in the housing side walls coact with the bosses 52 d in the cartridge side wall to orientate the cartridge within the housing in one of two possible positions.</p> <p>Lazaris at Fig. 7:</p>

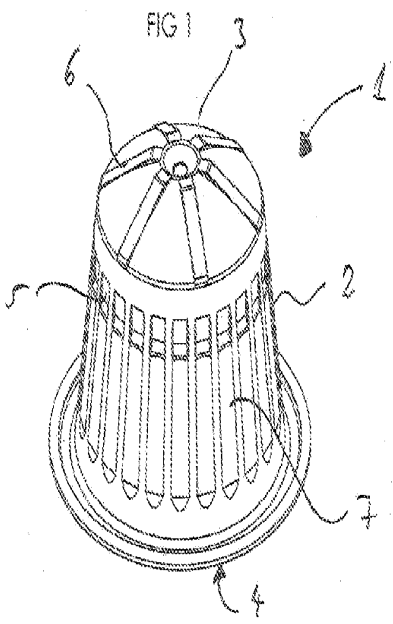
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	 <p>FIG. 7</p> <p>See also Lazaris at Fig. 8A.</p> <p>Mariller at [0020]-[0032]:</p> <p>List of numerical references used in the figures:</p> <ol style="list-style-type: none"> 1. capsule 2. side wall 3. top wall 4. bottom wall 5. cavity 6. top wall stiffening element 7. side wall stiffening element 8. top edge stiffening element 9. internal protrusion 10. beading

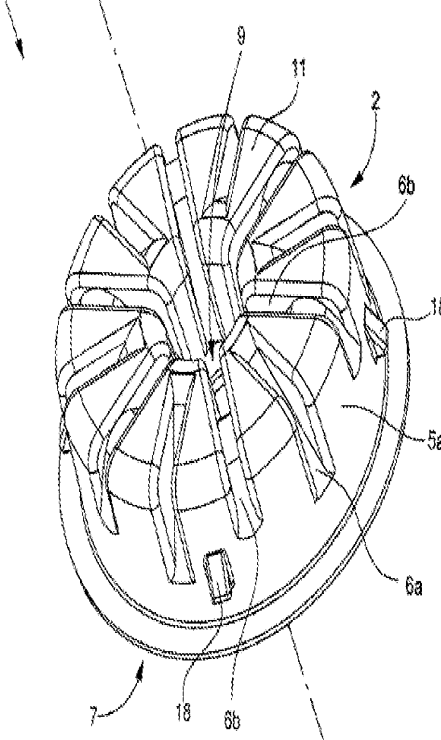
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	<p>11. weakened zone 12. piercing element</p> <p>Mariller at [0034]:</p> <p>a) The top part of the capsule is reinforced by an architecture known as an “exposed beams”, “reinforcing” or “framework” architecture the purpose of which is to reinforce the capsule in its ability to withstand the pressure of the water and at the time of its perforation. It is also possible to obtain a reinforced structure using folds of material. The rigidity may also be reinforced using an architecture of the “exposed beams” or “framework” type which is concave in relation to the capsule (see FIG. 2).</p> <p>Mariller at [0037]-[0038]:</p> <p>c) On the outside of the capsule, opposite each projecting element or opposite a circumferential rim, a cavity is created which strengthens the lateral parts of the capsule through a framework effect while at the same time saving on material (see cross section) and in particular allows the use of biodegradable material and fine materials of the PET or metal type or any other petroleum-derived material. The lateral reinforcement of the capsule may also be created by folds of the material (see FIGS. 5-6).</p> <p>d) The outer lateral part of the capsule has facets which may extend as far as the vicinity of the bottom part of the capsule or over a certain distance in the heightwise direction. In this alternative form also, it is therefore possible to save on material while at the same time reinforcing the lateral parts of the capsule (see FIGS. 7-8).</p> <p>Mariller at Fig. 1:</p>

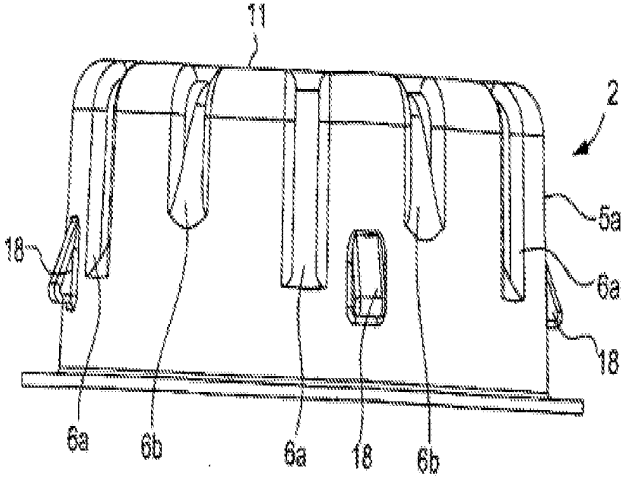
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	 <p>FIG 1</p> <p>See also Mariller at Figs. 2, 7, 8.</p> <p>Mock at [0027]:</p> <p>The packaging according to the invention may be produced with very diverse shapes and in very diverse materials. It may be rigid, for example made of thermoforming plastic or stamping thin metal sheet, for example made of aluminum, and have an outline that is, for example, circular, rectangular or hexagonal.</p> <p>Mock at [0036]:</p> <p>According to another preferred embodiment, the part of the packaging from which the hollow shaft departs is produced with strengthening ribs and/or with ribs for positioning the nozzle, these ribs being formed, for example by thermoforming, as recesses in the end wall and the wall and being orientated toward the hollow shaft.</p>

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	<p>Mock at [0077]:</p> <p>As can also be seen in FIGS. 2 and 3, in this first embodiment, the capsule 2 has ribs 6a, 6b extending from the hollow shaft 9 to the periphery. A first series of ribs 6a plays a part in reinforcing the capsule 2, and possibly in partitioning it as will be seen later on. A second series of ribs 6b is designed to prevent the nozzle from rotating in the packaging, as will be explained with reference to FIGS. 6 and 7. . . .</p> <p>Mock at FIGs. 1-2:</p> 

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	 <p>Fig.2</p> <p>Rapparini at [0007]:</p> <p>The present invention allows overcoming the problems and drawbacks of the systems known in the prior art. In particular, the present invention guarantees stability of the structure of filtering and permeable containers so that they can be easily handled in packaging and/or filling machines even when these machines operate at very high rates. Moreover, the present invention provides containers which are easily employed in automatic machines both for domestic and industrial use.</p> <p>Rapparini at [0009]:</p> <p>The present invention is based on the idea of providing the body of the container with longitudinal stiffening ribs wherein the length of the ribs is variable along the surface of the body. The presence of ribs having different lengths on the body of the container allows the</p>

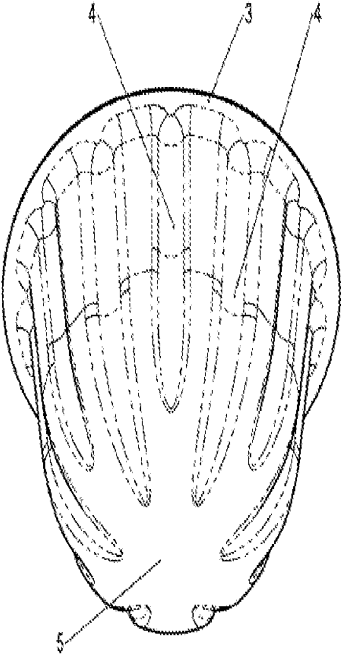
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	<p>optimization of the stability of the container. The modulation of the length of the ribs along the surface of the container allows improving the stability and rigidity of the system.</p> <p>Rapparini at [0010]:</p> <p>According to an embodiment of the present invention, a filtering and permeable container for substances suitable for the preparation of beverages is provided, the container being made by means of thermoforming starting from a flat strip of permeable, filtering and thermoformable material, wherein the body of the container comprises longitudinal stiffening ribs, wherein the length of the ribs is variable along the surface of the body.</p> <p>Rapparini at [0011]:</p> <p>According to a further embodiment of the present invention, a container is provided, wherein long and short ribs are alternated along the surface of the body. The stability of the container is accordingly optimized by providing for example long ribs extending at least partially in the bottom region of the container alternated to short ribs extending only along the side region of the container.</p> <p>Rapparini at [0013]:</p> <p>According to a further embodiment of the present invention, a container is provided, wherein at least along a portion of one or more of the ribs, the width of the ribs decreases toward the bottom of the container, so that said one or more of the ribs have a pointed shape. In this way the stability of the container is further optimized. In particular, the side portion of the body is stiffened by the presence of the stiffening ribs and the bottom portion is minimally altered by the presence of those ribs having a pointed shape pointing toward the bottom of the container.</p> <p>Rapparini at [0014]:</p>

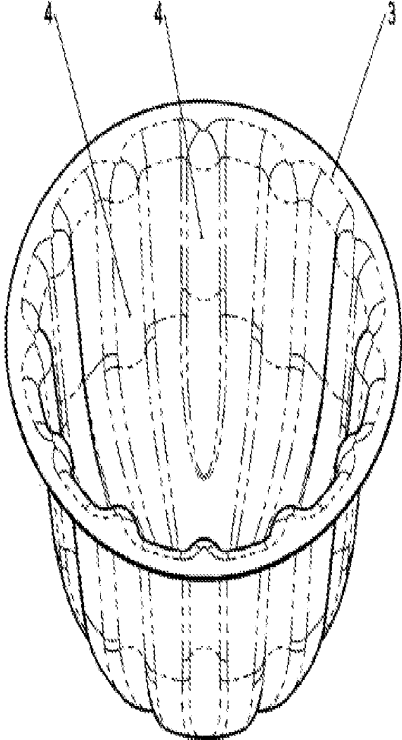
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	<p>According to a further embodiment of the present invention , a container is provided, wherein the stiffening ribs increase the filtering surface of the body.</p> <p>Rapparini at [0019]:</p> <p>According to a further embodiment of the present invention, a container is provided, wherein the container is adapted to be employed in automatic espresso machines. In particular, the container can be adapted to be employed for example for automatic domestic espresso machines or for industrial espresso machines.</p> <p>Rapparini at [0052]:</p> <p>Figures 6 and 6bis schematically display 3D views of the container according to an embodiment of the present invention. The container is provided with longitudinal stiffening ribs 4, and the length L of the stiffening ribs 4 is variable along the surface of the body 2 of the container. In particular, long and short ribs are alternated along the surface of the body 2. The long ribs extends toward the bottom region 5 of the container. In particular, the long ribs occupy a portion of the bottom region 5 of the container. The container has a cup-shaped bottom region 5. The long stiffening ribs occupy, therefore, a portion of the cup-shaped bottom region 5. Each short rib is placed between two long ribs and extends along the lateral region of the container. Accordingly, the stabilization of the structure is optimized and, at the same time, the filtering surface of the container is increased.</p> <p>Rapparini at FIG. 6 bis:</p>

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	 <p data-bbox="760 1262 846 1297">FIG. 6 bis</p>

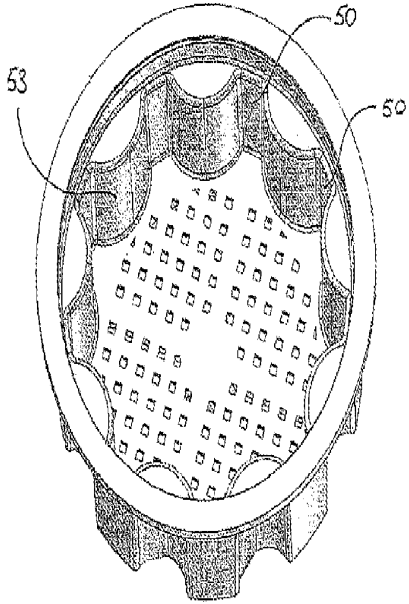
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	<p>Rapparini at FIG. 6:</p>  <p>Rubino at [0009]:</p> <p>The present invention provides several relevant advantages. The main advantage lies in the fact that the internal grooves of the capsule attain optimal flow conditions for the liquid passing through the capsule itself, to the advantage of the quality and repeatability of the end beverage and also of the correct operation of the associated machines, which are not subject to unforeseeably variable flow conditions.</p> <p>Rubino at [0012]:</p>

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	<p>The capsule 1 comprises a main body of substantially cylindrical overall geometry, which has just a longitudinal axis of symmetry A. In particular, the main body is comprised of a top face 2 and a bottom face 3 having a substantially circular contour, and of a lateral surface or skirt 4 bearing a plurality of grooves that will be detailed hereinafter. Such top and bottom faces 2 and 3 and lateral skirt 4 define an internal housing 10 of the capsule 1, better seen in Figures 7 and 8, receiving the ground coffee.</p> <p>Rubino at [0018]-[0019]:</p> <p>As mentioned above, in correspondence of its lateral skirt 4 the main body of the capsule 1 has a plurality of concave external grooves 5, identical the one to the other and equally distributed over the entire lateral extension of the skirt 4 itself according to an axial geometry. The grooves 5 develop in a direction substantially parallel to axis A of the capsule 1 and are partitioned by external longitudinal ribs 52. Also the latter are identical the one to the other, equally distributed over the entire lateral extension of the skirt 4, and develop along a direction substantially parallel to the axis A of the capsule 1.</p> <p>As it is better seen in Figure 8, the external ribs 52 are internally hollow, thereby producing in correspondence of the housing 10 a plurality of grooves or internal notches 50 of the capsule itself. Therefore, said internal notches 50 define longitudinal portions of the housing 10 inside which part of the ground coffee is received. The presence and arrangement of the notches 50 allows, as already mentioned above, optimal conveyance of the extraction fluid within the capsule 1, preventing stagnation, allowing to accurately control and foresee the properties of said flow and generally to optimize the extraction process.</p> <p>Rubino at Claim 1:</p> <p>A capsule (1) of the type containing or apt to contain a substantially granular infusion for making beverages such as coffee and the like in an extraction process providing the passing through the capsule itself by an extraction fluid, said capsule (1) comprising a main body (2, 3, 4) defining an internal housing (10) apt to receive said infusion (C), characterized in that said main body (2, 3, 4) has, in correspondence of at least part of the lateral wall (4) of said</p>

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	<p>housing (10), a plurality of internal longitudinal grooves (50) arranged substantially in the direction of the extraction fluid flow and apt to convey such a fluid through the capsule (1) itself.</p> <p>Rubino at Fig. 8:</p>  <p>FIG. 8</p> <p>See also Rubino at Claims 2, 3, 6; Figs. 1-4, 7.</p> <p>Sweeney at Abstract:</p> <p>A beverage filter cartridge includes a cup-shaped outer container with a bottom and a side wall extending upwardly from the bottom wall to a circular rim surrounding an upper</p>

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	<p>opening. The side wall has an upper section extending downwardly from the rim to an intermediate section, and a tapered lower section configured to provide a plurality of circumferentially spaced flutes extending downwardly from the intermediate section to the bottom wall. A filter element subdivides the interior of the container into first and second chambers. A beverage medium is stored in the first chamber. A cover is joined to the side wall at the rim to close the upper opening. The cover is yieldably piercable to accommodate an injection of liquid into the first chamber for combination with the beverage medium to produce a beverage. The filter element is permeable to accommodate a flow of the beverage from the first chamber into the second chamber, and the bottom wall is yieldably piercable to accommodate an outflow of the beverage from the second chamber to the exterior of the cartridge.</p> <p>Sweeney at 2:20-35</p> <p>In accordance with the present invention, the container side wall is provided with circumferentially spaced flutes which are strategically positioned to enhance resistance to buckling without interfering with or compromising the integrity of the seal between the side wall and the filter component. The location at which the filter component is joined to the interior side wall of the container is lowered to achieve a beneficial increase in beverage medium storage capacity. This location is defined by a tapered circular ledge against which the tapered filter component is reliably sealed.</p> <p>The channels formed between the circumferentially spaced flutes serve to efficiently direct the brewed beverage downwardly towards the pierced container bottom, with an accompanying beneficial increase in turbulence in the head space defined between the filter element and container side wall.</p> <p>Sweeney at 2:47-55</p> <p>In a third embodiment of the present invention, the circumferentially spaced flutes protrude sufficiently inwardly into the container interior to radially contact the filter element at circumferentially spaced locations. This radial contact beneficially guides the filter element</p>

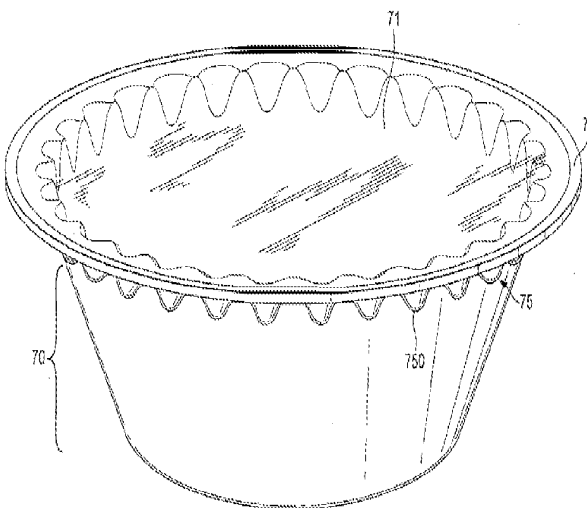
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	<p>into its centrally located position during assembly of the cartridge components, and, during the processing cycle, provides radial support which resists distortion and possible bursting of the filter element.</p> <p>Sweeney at 3:65-4:8</p> <p>The lower tapered wall section 20 c is configured to provide a plurality of circumferentially spaced flutes 20 e, the upper ends of which terminate beneath the intermediate section defined by ledge 20 b, and the lower ends of which terminate as indentations in the bottom wall 18.</p> <p>It will be seen from FIG. 8 that the depths “d” of the flutes 20 e gradually increase from a minimum at their upper ends to a maximum at their lower ends. Likewise, as can be seen from FIG. 7, the widths “w” of the flutes also gradually increase from a minimum at their upper ends to a maximum at their lower ends.</p> <p>Sweeney at 5:11-19</p> <p>In all embodiments, the downwardly diverging and gradually deepening of the flutes serves to promote downward flow of the brewed beverage in chamber B while beneficially encouraging turbulence. The upwardly protruding bosses 18 a, 318 a on the container bottoms of the first and third embodiments provide readily accessible support platforms for the bottoms of the filter elements. Securing the bottoms of the filter elements to the bosses 18 a, 218 a insures that the filter elements will not be punctured by the outlet probe 30.</p> <p>Sweeney at Fig. 1:</p>

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	<div data-bbox="649 399 941 903" data-label="Image"> </div> <p data-bbox="662 907 755 955">FIG. 1</p> <p data-bbox="609 1018 1036 1060"><i>See also</i> Sweeney at Figs. 2, 3, 5, 7, 9-11, and 15.</p> <p data-bbox="609 1096 766 1138">Yoakim at [0161]:</p> <p data-bbox="609 1176 1331 1218">In yet another embodiment, the surface of the capsule comprises a toothed structure.</p> <p data-bbox="609 1253 766 1295">Yoakim at [0215]:</p> <p data-bbox="609 1331 1421 1696">FIG. 23 illustrates another capsule of the invention. The capsule comprises means for connecting it to the external rotational driving means of the device. For this, capsule has a toothed structure 75 on at least one of its outer surface. The capsule has a body 70 comprising an upper edge 72 which can be closed by an upper membrane 71. The toothed structure comprises a series of teeth which is positioned below the edge or rim 72 of the body of the capsule. The teeth are placed along the whole periphery of the body of the capsule. The body of the capsule can be made of plastic and/or aluminium or aluminium alloy. For example, it can be moulded by injection of plastic or deep drawn in aluminium. For example, the shape of the teeth could be slightly triangular, oval, rectangular or pyramidal. It should be noticed that the</p>

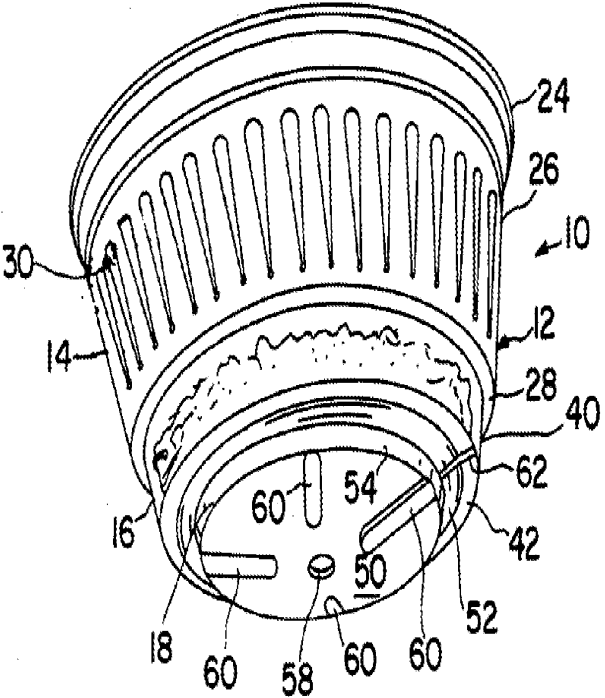
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	<p>teeth could be replaced by other equivalent structures such as series of elements in relief and/or hollow. For example, slits, pins or small needles can be envisaged.</p> <p>Yoakim at [0216]:</p> <p>The device itself that receives the capsule of FIG.23 comprises a toothed surface of complementary shape. FIG. 24 shows a capsule holder 44 adapted to receive the capsule of FIG. 23. The capsule holder has a cavity into which are provided hollow teeth 440. The hollow teeth are arranged to fit the teeth 750 on the outer surface of the capsule. <i>See, e.g.</i>, [0216].</p> <p>Yoakim at FIG. 23:</p> <div style="text-align: center;">  <p>FIG. 23</p> </div> <p>WW</p>

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<p>[1.i] the cavity has radially spaced and vertically oriented drawn ribs.</p>	<p>The below cited art discloses, either expressly or inherently, the cavity has radially spaced and vertically oriented drawn ribs. <i>See, e.g.:</i></p> <p><i>See</i> [1.h].</p> <p>Erickson at 5:9-26:</p> <p>The reservoir 14 of the container 12 is open at the top and includes a rim 24, a depending side wall 26 and a bottom wall 28. The rim 24 extends laterally and outwardly from the upper end of the wall 26 to facilitate pouring of the water or other liquid into the reservoir and movement of the coffee maker 10 without spilling. The wall 26 is cylindrical and is stepped and tapered inwardly and includes vertical ribs 30 for strengthening. The bottom wall 28, in the illustrative embodiment, is in the form of an annular shoulder and includes a relatively large central opening 32. As illustrated, the reservoir 14 of the invention is configured to contain the appropriate amount of water necessary to brew the desired amount of coffee and to provide the necessary hydrostatic pressure to the partition 20 to cause the partition 20 to allow the flow of water therethrough at the desired brewing temperature.</p> <p>Erickson at Fig. 1:</p>

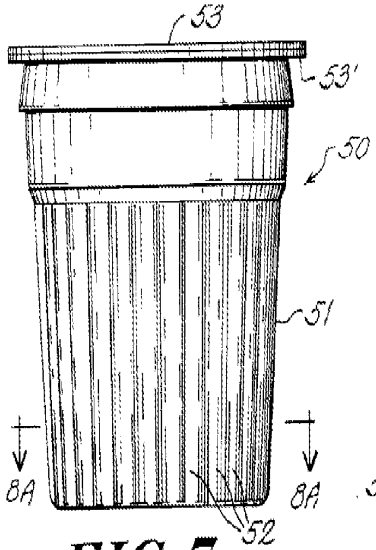
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	 <p style="text-align: center;">FIG. 1</p> <p>Lazaris at [0028]:</p> <p>A typical beverage filter cartridge is depicted ay 50 in FIGS. 7 and 8A. The cartridge includes a cup-shaped base 51 having an inverted frustum-shaped side wall interrupted by surface irregularities indicated typically at 52 and comprising circumferentially spaced grooves. The cup-shaped base is closed by a lid 53. As herein employed, the term “surface irregularity” is intended to broadly encompass any deviation from a smooth surface than can mechanically</p>

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	<p>interengage with adjacent components or surfaces of the housing 28. Non limiting examples of such surface irregularities may comprise a uniform array of grooves as shown in FIG. 8A, or pairs of oppositely disposed grooves 52 a in the side wall of a cartridge 50 a as shown in FIG. 8B, or a single surface irregularity such as the outwardly projecting rib 54 b in the side wall of cartridge 50 b as shown in FIG. 8C.</p> <p>Lazaris at [0039]:</p> <p>FIG. 6 illustrates an alternative embodiment of a cartridge holder in which the side wall of the housing 28 is provided with internal grooves 300" configured and arranged to slidably receive and coact in mechanical interengagement with externally projecting ribs 52 c in the side wall of cartridge 50 c Still another embodiment of a cartridge holder is illustrated in FIGS. 9-11. The cartridge 50 d is of the type described in the above-referenced patent application Ser. No. 09/782,660, with generally flat side walls diverging upwardly from a bottom to a top opening closed by a lid 53 a. Oppositely facing side walls are provided with surface irregularities in the form of protruding somewhat triangular-shaped bosses 52 d.</p> <p>Lazaris at [0041]:</p> <p>The recesses 301 in the housing side walls coact with the bosses 52 d in the cartridge side wall to orientate the cartridge within the housing in one of two possible positions.</p> <p>Lazaris at Fig. 7:</p>

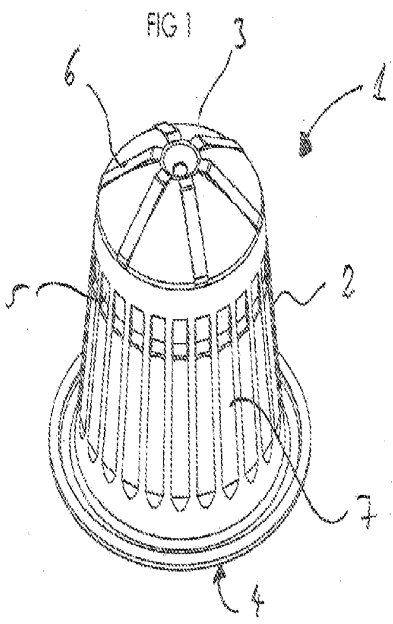
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	 <p>FIG. 7</p> <p>See also Lazaris at Fig. 8A.</p> <p>Mariller at [0020]-[0032]:</p> <p>List of numerical references used in the figures:</p> <ol style="list-style-type: none"> 1. capsule 2. side wall 3. top wall 4. bottom wall 5. cavity 6. top wall stiffening element 7. side wall stiffening element 8. top edge stiffening element 9. internal protrusion 10. beading

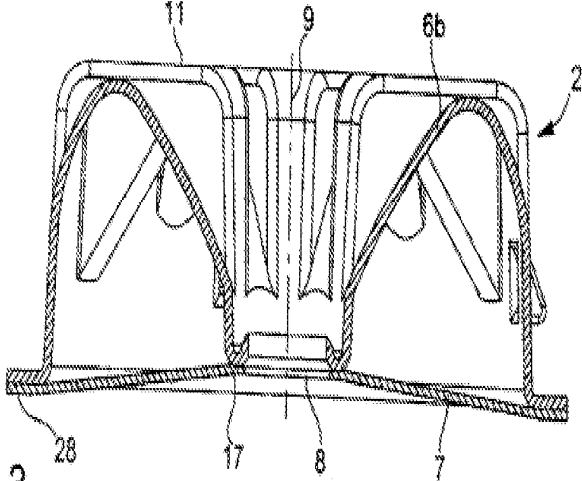
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	<p>11. weakened zone 12. piercing element</p> <p>Mariller at [0034]:</p> <p>a) The top part of the capsule is reinforced by an architecture known as an “exposed beams”, “reinforcing” or “framework” architecture the purpose of which is to reinforce the capsule in its ability to withstand the pressure of the water and at the time of its perforation. It is also possible to obtain a reinforced structure using folds of material. The rigidity may also be reinforced using an architecture of the “exposed beams” or “framework” type which is concave in relation to the capsule (see FIG. 2).</p> <p>Mariller at [0037]-[0038]:</p> <p>c) On the outside of the capsule, opposite each projecting element or opposite a circumferential rim, a cavity is created which strengthens the lateral parts of the capsule through a framework effect while at the same time saving on material (see cross section) and in particular allows the use of biodegradable material and fine materials of the PET or metal type or any other petroleum-derived material. The lateral reinforcement of the capsule may also be created by folds of the material (see FIGS. 5-6).</p> <p>d) The outer lateral part of the capsule has facets which may extend as far as the vicinity of the bottom part of the capsule or over a certain distance in the heightwise direction. In this alternative form also, it is therefore possible to save on material while at the same time reinforcing the lateral parts of the capsule (see FIGS. 7-8).</p> <p>Mariller at Fig. 1:</p>

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	 <p>See also Mariller at Figs. 2, 7, 8.</p> <p>Mock at [0027]:</p> <p>The packaging according to the invention may be produced with very diverse shapes and in very diverse materials. It may be rigid, for example made of thermoforming plastic or stamping thin metal sheet, for example made of aluminum, and have an outline that is, for example, circular, rectangular or hexagonal.</p> <p>Mock at [0036]:</p> <p>According to another preferred embodiment, the part of the packaging from which the hollow shaft departs is produced with strengthening ribs and/or with ribs for positioning the nozzle, these ribs being formed, for example by thermoforming, as recesses in the end wall and the wall and being orientated toward the hollow shaft.</p>

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	<p>Mock at [0077]:</p> <p>As can also be seen in FIGS. 2 and 3, in this first embodiment, the capsule 2 has ribs 6a, 6b extending from the hollow shaft 9 to the periphery. A first series of ribs 6a plays a part in reinforcing the capsule 2, and possibly in partitioning it as will be seen later on. A second series of ribs 6b is designed to prevent the nozzle from rotating in the packaging, as will be explained with reference to FIGS. 6 and 7. . . .</p> <p>See FIG. 3.</p>  <p>Fig.3</p> <p>Rapparini at FIG. 6:</p>

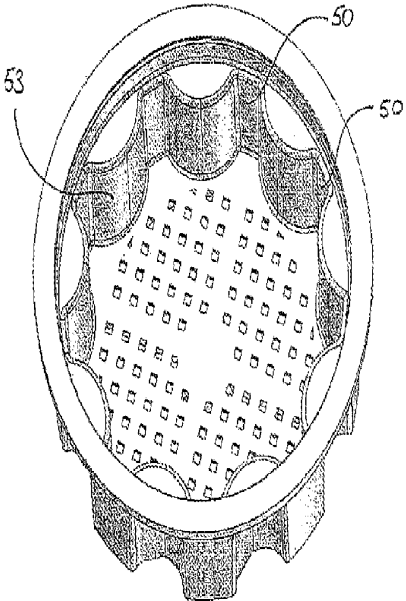
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	<div data-bbox="618 478 1015 1213" data-label="Image"> </div> <p data-bbox="609 1234 760 1266">Rubino at [0009]:</p> <p data-bbox="609 1308 1409 1507">The present invention provides several relevant advantages. The main advantage lies in the fact that the internal grooves of the capsule attain optimal flow conditions for the liquid passing through the capsule itself, to the advantage of the quality and repeatability of the end beverage and also of the correct operation of the associated machines, which are not subject to unforeseeably variable flow conditions.</p> <p data-bbox="609 1549 760 1581">Rubino at [0012]:</p> <p data-bbox="609 1623 1409 1703">The capsule 1 comprises a main body of substantially cylindrical overall geometry, which has just a longitudinal axis of symmetry A. In particular, the main body is comprised of a top face</p>

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	<p>2 and a bottom face 3 having a substantially circular contour, and of a lateral surface or skirt 4 bearing a plurality of grooves that will be detailed hereinafter. Such top and bottom faces 2 and 3 and lateral skirt 4 define an internal housing 10 of the capsule 1, better seen in Figures 7 and 8, receiving the ground coffee.</p> <p>Rubino at [0018]-[0019]:</p> <p>As mentioned above, in correspondence of its lateral skirt 4 the main body of the capsule 1 has a plurality of concave external grooves 5, identical the one to the other and equally distributed over the entire lateral extension of the skirt 4 itself according to an axial geometry. The grooves 5 develop in a direction substantially parallel to axis A of the capsule 1 and are partitioned by external longitudinal ribs 52. Also the latter are identical the one to the other, equally distributed over the entire lateral extension of the skirt 4, and develop along a direction substantially parallel to the axis A of the capsule 1.</p> <p>As it is better seen in Figure 8, the external ribs 52 are internally hollow, thereby producing in correspondence of the housing 10 a plurality of grooves or internal notches 50 of the capsule itself. Therefore, said internal notches 50 define longitudinal portions of the housing 10 inside which part of the ground coffee is received. The presence and arrangement of the notches 50 allows, as already mentioned above, optimal conveyance of the extraction fluid within the capsule 1, preventing stagnation, allowing to accurately control and foresee the properties of said flow and generally to optimize the extraction process.</p> <p>Rubino at Claim 1:</p> <p>A capsule (1) of the type containing or apt to contain a substantially granular infusion for making beverages such as coffee and the like in an extraction process providing the passing through the capsule itself by an extraction fluid, said capsule (1) comprising a main body (2, 3, 4) defining an internal housing (10) apt to receive said infusion (C), characterized in that said main body (2, 3, 4) has, in correspondence of at least part of the lateral wall (4) of said housing (10), a plurality of internal longitudinal grooves (50) arranged substantially in the</p>

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	<p>direction of the extraction fluid flow and apt to convey such a fluid through the capsule (1) itself.</p> <p>Rubino at Fig. 8:</p>  <p style="text-align: center;">FIG. 8</p> <p>See also Rubino at Claims 2, 3, 6; Figs. 1-4, 7.</p> <p>Sweeney - U.S. Patent Number 6,645,537</p> <p>Sweeney at Abstract:</p>

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	<p>A beverage filter cartridge includes a cup-shaped outer container with a bottom and a side wall extending upwardly from the bottom wall to a circular rim surrounding an upper opening. The side wall has an upper section extending downwardly from the rim to an intermediate section, and a tapered lower section configured to provide a plurality of circumferentially spaced flutes extending downwardly from the intermediate section to the bottom wall. A filter element subdivides the interior of the container into first and second chambers. A beverage medium is stored in the first chamber. A cover is joined to the side wall at the rim to close the upper opening. The cover is yieldably pierceable to accommodate an injection of liquid into the first chamber for combination with the beverage medium to produce a beverage. The filter element is permeable to accommodate a flow of the beverage from the first chamber into the second chamber, and the bottom wall is yieldably pierceable to accommodate an outflow of the beverage from the second chamber to the exterior of the cartridge.</p> <p>Sweeney at 2:20-35</p> <p>In accordance with the present invention, the container side wall is provided with circumferentially spaced flutes which are strategically positioned to enhance resistance to buckling without interfering with or compromising the integrity of the seal between the side wall and the filter component. The location at which the filter component is joined to the interior side wall of the container is lowered to achieve a beneficial increase in beverage medium storage capacity. This location is defined by a tapered circular ledge against which the tapered filter component is reliably sealed.</p> <p>The channels formed between the circumferentially spaced flutes serve to efficiently direct the brewed beverage downwardly towards the pierced container bottom, with an accompanying beneficial increase in turbulence in the head space defined between the filter element and container side wall.</p> <p>Sweeney at 2:47-55</p>

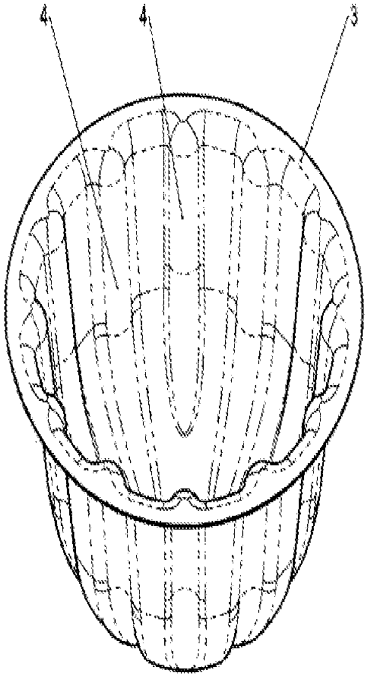
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	<p>In a third embodiment of the present invention, the circumferentially spaced flutes protrude sufficiently inwardly into the container interior to radially contact the filter element at circumferentially spaced locations. This radial contact beneficially guides the filter element into its centrally located position during assembly of the cartridge components, and, during the processing cycle, provides radial support which resists distortion and possible bursting of the filter element.</p> <p>Sweeney at 3:65-4:8</p> <p>The lower tapered wall section 20 c is configured to provide a plurality of circumferentially spaced flutes 20 e, the upper ends of which terminate beneath the intermediate section defined by ledge 20 b, and the lower ends of which terminate as indentations in the bottom wall 18.</p> <p>It will be seen from FIG. 8 that the depths “d” of the flutes 20 e gradually increase from a minimum at their upper ends to a maximum at their lower ends. Likewise, as can be seen from FIG. 7, the widths “w” of the flutes also gradually increase from a minimum at their upper ends to a maximum at their lower ends.</p> <p>Sweeney at 5:11-19</p> <p>In all embodiments, the downwardly diverging and gradually deepening of the flutes serves to promote downward flow of the brewed beverage in chamber B while beneficially encouraging turbulence. The upwardly protruding bosses 18 a, 318 a on the container bottoms of the first and third embodiments provide readily accessible support platforms for the bottoms of the filter elements. Securing the bottoms of the filter elements to the bosses 18 a, 218 a insures that the filter elements will not be punctured by the outlet probe 30.</p> <p>Sweeney at Fig. 1:</p>

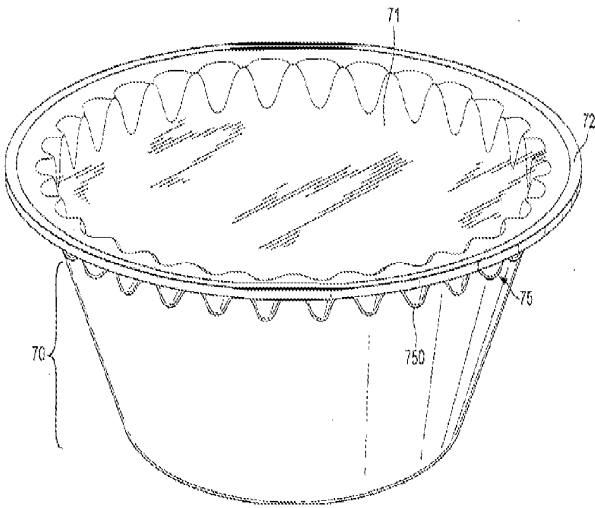
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	<div data-bbox="649 399 941 903" data-label="Image"> </div> <p data-bbox="662 907 755 955">FIG. 1</p> <p data-bbox="609 1018 1036 1060"><i>See also</i> Sweeney at Figs. 2, 3, 5, 7, 9-11, and 15.</p> <p data-bbox="609 1096 766 1138">Yoakim at [0161]:</p> <p data-bbox="609 1176 1331 1218">In yet another embodiment, the surface of the capsule comprises a toothed structure.</p> <p data-bbox="609 1253 766 1295">Yoakim at [0215]:</p> <p data-bbox="609 1331 1421 1696">FIG. 23 illustrates another capsule of the invention. The capsule comprises means for connecting it to the external rotational driving means of the device. For this, capsule has a toothed structure 75 on at least one of its outer surface. The capsule has a body 70 comprising an upper edge 72 which can be closed by an upper membrane 71. The toothed structure comprises a series of teeth which is positioned below the edge or rim 72 of the body of the capsule. The teeth are placed along the whole periphery of the body of the capsule. The body of the capsule can be made of plastic and/or aluminium or aluminium alloy. For example, it can be moulded by injection of plastic or deep drawn in aluminium. For example, the shape of the teeth could be slightly triangular, oval, rectangular or pyramidal. It should be noticed that the</p>

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	<p>teeth could be replaced by other equivalent structures such as series of elements in relief and/or hollow. For example, slits, pins or small needles can be envisaged.</p> <p>Yoakim at [0216]:</p> <p>The device itself that receives the capsule of FIG.23 comprises a toothed surface of complementary shape. FIG. 24 shows a capsule holder 44 adapted to receive the capsule of FIG. 23. The capsule holder has a cavity into which are provided hollow teeth 440. The hollow teeth are arranged to fit the teeth 750 on the outer surface of the capsule.</p> <p>Yoakim at FIG. 6:</p> 

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	<p>Yoakim at FIG. 23:</p>  <p>FIG. 23</p> <p>See also [1.h].</p>
<p>4. The beverage system according to claim 1, wherein the water is pushed into the portion capsule along a central axis that is perpendicular to the flange of the portion capsule.</p>	<p>The below cited art discloses, either expressly or inherently, the beverage system according to claim 1, wherein the water is pushed into the portion capsule along a central axis that is perpendicular to the flange of the portion capsule. <i>See, e.g.:</i></p> <p>Boyd at [0003]:</p> <p>Automated coffee machines have long been used for brewing coffee, both in large-scale commercial settings and in smaller business and home settings. These machines typically</p>

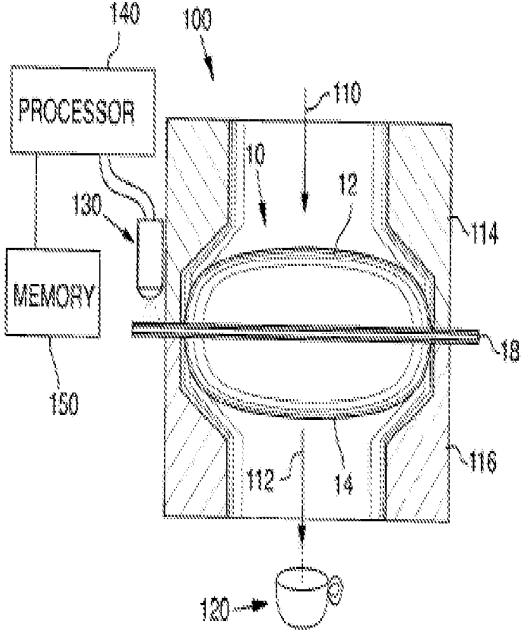
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	<p>operate on the principle of placing a quantity of ground coffee into a filter, and passing hot water through the ground coffee to produce a coffee beverage.</p> <p>Boyd at [0019]-[0021]:</p> <p>Although the present invention may be used in virtually any brewing machine, it is described herein for use in the context of machines such as those disclosed in U.S. Pat. No. 5,974,949 to Weber et al. and U.S. Pat. No. 6,035,762 to Ruckstuhl. Those patents disclose machines for brewing espresso using espresso packets in the form of filter capsules which are received through a funnel into a brewing chamber where water is passed through the filter capsule to produce an espresso beverage. The subject matter of each of these patents is incorporated herein by this reference.</p> <p>The invention also may be practiced in connection with espresso machines such as those disclosed in U.S. Pat. Nos. 4,253,385, 4,254,694, 4,353,293, 4,429,623, 4,484, 515, 4,555,894 and 4,852,333, all to Illy. These patents disclose various aspects of espresso machines which include brewing chambers configured to receive pre-fabricated espresso packets through which water is passed to produce an espresso drink. The subject matter of each of these patents also is incorporated herein by this reference.</p> <p>While the aforementioned machines generally are described for use in connection with espresso packets which contain a single serving of espresso, it will be appreciated that the present invention considers application of the relevant principles to machines which employ coffee packets for use in brewing multiple cups, which employ coffee packets of various size and shape, which employ various filter media and which contain coffee of various varieties, roasts, and grinds. Furthermore, the packet and methodology described herein may also produce other types of beverages such as tea, cider, and/or any beverage which is produced by mixing various ingredients. The packet and methodology is not limited to hot beverages and may be used to produce cold beverages.</p> <p>Boyd at [0024]:</p>

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	<p>Focusing now particularly on the invented encoded coffee packet, it will be appreciated that such packet typically takes the form of a coffee-filled packet configured for placement in a fluid path of a coffee machine whereby hot water (or steam) flows through the packet to produce a coffee beverage. An exemplary packet is depicted in FIGS. 1-3, such packet being indicated generally at 10.</p> <p>Boyd at [0031]:</p> <p>FIG. 3 schematically depicts a coffee machine 100 designed to utilize packet 10. In the depicted embodiment, packet 10 is positioned between input fluid path 110 and output fluid path 112. Gasket 18 helps form a seal between chamber 114, defining the input fluid path, and chamber 116, defining the output fluid path. Gasket 18 also helps secure packet 10 in place. In other embodiments, packet 10 is held in place by gravity, water pressure, friction, adhesion, magnetism, or other suitable mechanisms. As depicted, water passes into packet 10 along input fluid path 110, passing through filter portion 12. The water contacts ground coffee within packet 10, producing a coffee beverage. The coffee beverage then flows through packet 10 and out through filter portion 14. Thereafter, the coffee beverage continues along output fluid path 112 and into beverage receptacle 120. In one embodiment, water is stored in a reservoir (not shown) within coffee machine 100 and heated before entering input fluid path 110. Alternatively, water is externally heated before entering input fluid path 110, or not heated at all. Beverage receptacle 120 may be dimensioned to accommodate multiple servings of the brewed coffee beverage, or may be dimensioned to receive a single serving of brewed coffee.</p> <p>Boyd at [0036]:</p> <p>For example, a person desiring weaker coffee may purchase packets designated such in order to direct the machine to add water to the brewed coffee beverage in accordance with proper brewing procedure. This avoids problems associated with ill-advised attempts to dilute coffee by decreasing the quantity of coffee used, a change which may result in a corresponding change in bed depth, and thus in an undesirable change in coffee taste.</p>

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	<p>Boyd at Fig. 3:</p> <p>FIG.3</p>  <p>Lazaris at [0010]:</p> <p>The holder of the present invention is designed for use in an apparatus for brewing a beverage by infusing heated liquid with a beverage medium contained in a single serve disposable cartridge. In one embodiment of the present invention, the holder is configured for use within a cartridge having an inverted frustum-shaped side wall specially contoured to provide at least one and preferably a plurality of strategically placed surface irregularities. The cartridge is removably received in a cup-shaped housing having a side wall configured and dimensioned to surround the cartridge side wall. Locating elements are arranged to coact with the one or plural surface irregularities in the cartridge side wall to rotatably immobilize the cartridge within the housing. A lid is mounted for manipulation between an open position</p>

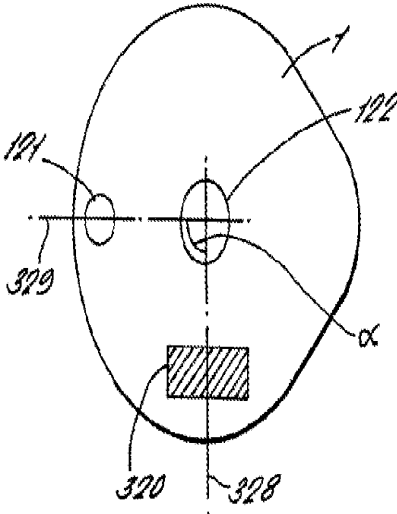
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	<p>accommodating insertion and removal of the cartridge, and a closed position confining the cartridge within the housing. Tubular probes associated with the lid and housing are arranged to pierce the thus confined cartridge to thereby accommodate a through flow of heated liquid for infusion with the beverage medium contained in the cartridge.</p> <p>Lazaris at [0037]:</p> <p>In FIG. 2B, the lid 40 has been lowered, resulting in the cartridge 50 and the cartridge platform 86 being forced downwardly against the action of spring 92. As a result, the cartridge lid and base are pierced respectively by the inlet and outlet probes 126, 84, thus accommodating a flow of heated liquid through the cartridge. The heated liquid infuses a beverage medium (not shown) contained in the cartridge to thereby produce a beverage which exits the cartridge via the outlet probe 84.</p> <p>Lazaris at Fig. 11:</p> <p style="text-align: center;">FIG. 11</p>

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	<p>Panesar at p. 17 at line 29 – p. 18 at line 5:</p> <p>An aqueous medium, typically water, under pressure enters the cartridge 1 through the inlet 121 into the inlet chamber 26 at a pressure of between 0.1-2.0 bar. From there the water is directed to flow through the slots 30 and round the manifold 16 and into the filtration chamber 130 of the cartridge 1 through the plurality of slots 17. The water is forced radially inwardly through the filtration chamber 130 and mixes with the beverage ingredients 200 contained therein.</p> <p>Panesar at p. 37, ll. 17-24:</p> <p>In the brew/mixing stage water is passed through the cartridge 1 in order to produce the beverage from the beverage ingredients 200. The temperature of the water is determined by the control processor which sends instructions to the water heater 225 to heat the water passing from the water tank 220 to the brew head 250. Water enters the lower part 255 of the holder 251 through the conduit 262 via the inlet valve and the inlet piercer 253 into the inlet chamber 25 126 of the beverage cartridge 1.</p> <p>Panesar at FIG. 10:</p>

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	<p style="text-align: center;"><i>FIG. 10.</i></p>  <p>Sweeney at Abstract:</p> <p>A beverage filter cartridge includes a cup-shaped outer container with a bottom and a side wall extending upwardly from the bottom wall to a circular rim surrounding an upper opening. The side wall has an upper section extending downwardly from the rim to an intermediate section, and a tapered lower section configured to provide a plurality of circumferentially spaced flutes extending downwardly from the intermediate section to the bottom wall. A filter element subdivides the interior of the container into first and second chambers. A beverage medium is stored in the first chamber. A cover is joined to the side wall at the rim to close the upper opening. The cover is yieldably piercable to accommodate an injection of liquid into the first chamber for combination with the beverage medium to</p>

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	<p>produce a beverage. The filter element is permeable to accommodate a flow of the beverage from the first chamber into the second chamber, and the bottom wall is yieldably piercable to accommodate an outflow of the beverage from the second chamber to the exterior of the cartridge.</p> <p>Sweeney at 1:19-32:</p> <p>This beverage filter cartridge is comprised basically of an impermeable yieldably-piercable cup-shaped outer container internally subdivided by a permeable cone-shaped filter into first and second chambers. A granular or powdered dry beverage medium, e.g., roasted ground coffee, is stored in the first chamber, and the container is closed by an impermeable yieldably piercable lid.</p> <p>During a processing cycle, the lid and container bottom are pierced, respectively, by tubular inlet and outlet probes. The inlet probe admits heated liquid under pressure into the first chamber for infusion with the beverage medium, and the resulting brewed beverage passes through the filter into the second chamber from which it exits via the outlet probe for delivery to an underlying cup.</p> <p>Sweeney at 4:20-23:</p> <p>The lid may be cut or blanked from any suitable impermeable heat sealable and yieldably piercable material, such as for example, a metallic/polymer laminate supplied by Winpak Heat Seal Packaging, Inc. of Montreal, Canada.</p> <p>Sweeney at 4:35-42:</p> <p>At the onset of a processing cycle, the lid 16 and container bottom 18 are pierced, respectively, by tubular inlet and outlet probes 28, 30 (see FIG. 3). The inlet probe 28 admits a heated liquid, typically hot water, into chamber A where it infuses and combines with the beverage medium M to produce a beverage. The beverage passes through the filter element 14 into chamber B, from which it exits via outlet probe 30.</p>

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U.S. Patent No. 10,858,177	Disclosure
	<p>Yoakim at [0019]:</p> <p>The enclosure is typically thermoformed of a food grade plastic and includes a top wall or lid that includes at least one inlet port defining a passage for receiving a liquid that is to be introduced into the capsule, with the inlet port aligned with the central axis of the capsule, wherein the liquid to be injected into the capsule is water and wherein the extractable or infusible ingredient(s) is ground coffee, soluble coffee, a dairy based powder, a dairy or non-dairy creamer, cocoa, a Sweetener, leaf tea, herbal tea, a culinary powder, a soluble or dispersible nutritional composition, a liquid food concentrate or combinations thereof.</p> <p>Yoakim at [00021]:</p> <p>The liquid introducing means preferably comprises at least one needle for injecting liquid into the capsule at or near its central axis. . . .</p> <p>Yoakim at [0186]:</p> <p>At the inside surface of the injection lid 40 is placed a piercing structure 450 which has the function of piercing the injection side 30 of the capsule. A water injector or lance 50 is provided which traverses the injection side 30 and which comprises an injection conduit for carrying water from the water circuit into the capsule. . . .</p> <p>Yoakim at [0219]-[0220]:</p> <p>The invention also relates to a food liquid preparation device for preparing a food liquid from a food substance contained in a single-use capsule, removably insertable in the device, bypassing water through the substance in the capsule, comprising a water injection head in the capsule and a capsule holder for holding the capsule in the device, characterized in that it comprises: a water injector, as part of the water injection head, arranged for introducing water along a central axis relative to the capsule holder</p>

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<p>U.S. Patent No. 10,858,177</p>	<p>Disclosure</p>
	<p>Yoakim at FIG. 4:</p> <p>FIG. 4</p> <p>See also e.g., Yoakim at FIGS. 35, 54, 55, 61, 62.</p>

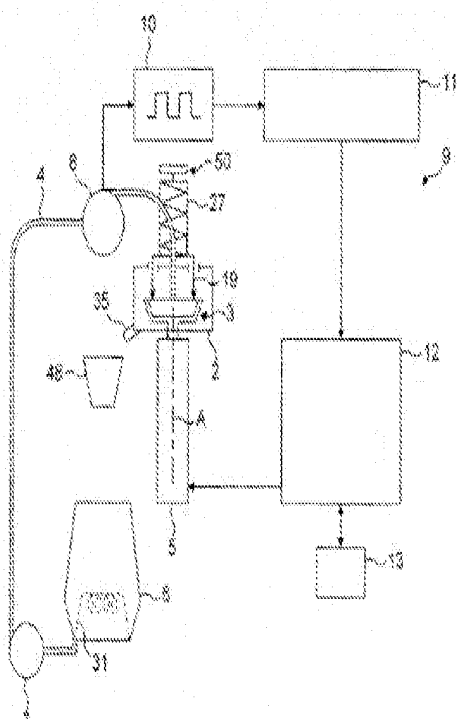
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	<i>See also</i> [1].
<p>5. The beverage system according to claim 4, wherein the beverage machine comprises a mandrel that pierces the lid in a region that is offset from the central axis.</p>	<p>The below cited art discloses, either expressly or inherently, the beverage system according to claim 4, wherein the beverage machine comprises a mandrel that pierces the lid in a region that is offset from the central axis. <i>See, e.g.:</i></p> <p>Boyd at [0019]-[0021]:</p> <p>Although the present invention may be used in virtually any brewing machine, it is described herein for use in the context of machines such as those disclosed in U.S. Pat. No. 5,974,949 to Weber et al. and U.S. Pat. No. 6,035,762 to Ruckstuhl. Those patents disclose machines for brewing espresso using espresso packets in the form of filter capsules which are received through a funnel into a brewing chamber where water is passed through the filter capsule to produce an espresso beverage. The subject matter of each of these patents is incorporated herein by this reference.</p> <p>The invention also may be practiced in connection with espresso machines such as those disclosed in U.S. Pat. Nos. 4,253,385, 4,254,694, 4,353,293, 4,429,623, 4,484, 515, 4,555,894 and 4,852,333, all to Illy. These patents disclose various aspects of espresso machines which include brewing chambers configured to receive pre-fabricated espresso packets through which water is passed to produce an espresso drink. The subject matter of each of these patents also is incorporated herein by this reference.</p> <p>While the aforementioned machines generally are described for use in connection with espresso packets which contain a single serving of espresso, it will be appreciated that the present invention considers application of the relevant principles to machines which employ coffee packets for use in brewing multiple cups, which employ coffee packets of various size and shape, which employ various filter media and which contain coffee of various varieties, roasts, and grinds. Furthermore, the packet and methodology described herein may also produce other types of beverages such as tea, cider, and/or any beverage which is produced</p>

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	<p>by mixing various ingredients. The packet and methodology is not limited to hot beverages and may be used to produce cold beverages.</p> <p><i>See also</i> [4].</p> <p>Jarisch at [0035]:</p> <p>The centrifugal unit 2 comprises a centrifugal cell 3. The cell 3 may comprise a capsule holder and a capsule received therein. The centrifugal unit is connected to driving means 5 such as a rotary motor. The centrifugal unit comprises a collecting part and an outlet 35. A receptacle 48 can be disposed below the outlet to collect the extracted beverage. The system further comprises liquid supply means such as a water reservoir 6 and a fluid circuit 4. Heating means 31 may also be provided in the reservoir or along the fluid circuit. The liquid supply means may further comprise a pump 7 connected to the reservoir. A flow restriction means 19 is provided to create a restriction to the flow of the centrifuged liquid which leaves the capsule. The system may further comprise a flow meter such as a flow-metering turbine 8 for providing a control of the flow rate of water supplied in the cell 3. The counter 11 can be connected to the flow-metering turbine 8 to enable an analysis of the generated impulse data 10. The analysed data is then transferred to the processor 12. Accordingly, the exact actual flow rate of the liquid within the fluid circuit 4 can be calculated in real-time. A user interface 13 may be provided to allow the user to input information that is transmitted to the control unit 9. Further characteristics of the system can be found in WO2010/026053.</p> <p>Jarisch at FIG. 1 (showing water line inserting into center of capsule perpendicular to flange location)</p>

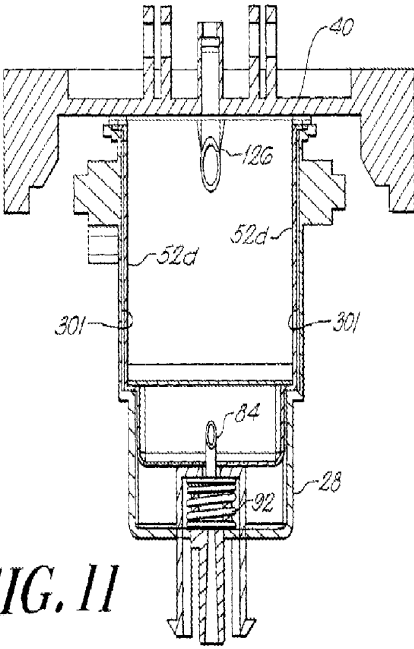
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U.S. Patent No. 10,858,177	Disclosure
	 <p>Fig. 1</p> <p>Lazaris at [0010]:</p> <p>The holder of the present invention is designed for use in an apparatus for brewing a beverage by infusing heated liquid with a beverage medium contained in a single serve disposable cartridge. In one embodiment of the present invention, the holder is configured for use within a cartridge having an inverted frustum-shaped side wall specially contoured to provide at least one and preferably a plurality of strategically placed surface irregularities. The cartridge is removably received in a cup-shaped housing having a side wall configured and dimensioned to surround the cartridge side wall. Locating elements are arranged to coact with the one or plural surface irregularities in the cartridge side wall to rotatably immobilize the cartridge</p>

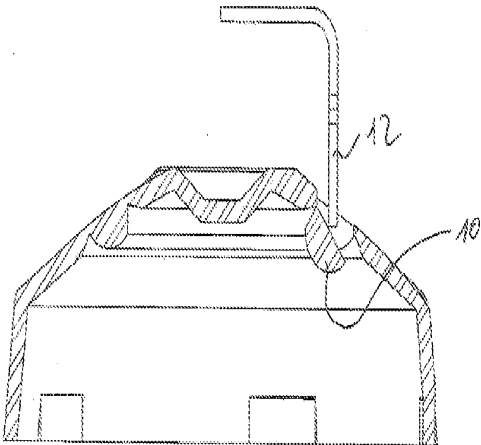
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	<p>within the housing. A lid is mounted for manipulation between an open position accommodating insertion and removal of the cartridge, and a closed position confining the cartridge within the housing. Tubular probes associated with the lid and housing are arranged to pierce the thus confined cartridge to thereby accommodate a through flow of heated liquid for infusion with the beverage medium contained in the cartridge.</p> <p>Lazaris at [0037]:</p> <p>In FIG. 2B, the lid 40 has been lowered, resulting in the cartridge 50 and the cartridge platform 86 being forced downwardly against the action of spring 92. As a result, the cartridge lid and base are pierced respectively by the inlet and outlet probes 126, 84, thus accommodating a flow of heated liquid through the cartridge. The heated liquid infuses a beverage medium (not shown) contained in the cartridge to thereby produce a beverage which exits the cartridge via the outlet probe 84.</p> <p>Lazaris at Fig. 11:</p>

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U.S. Patent No. 10,858,177	Disclosure
	 <p>FIG. 11</p> <p>Mariller at [0020]-[0032]:</p> <p>List of numerical references used in the figures:</p> <ol style="list-style-type: none"> 1. capsule 2. side wall 3. top wall 4. bottom wall 5. cavity 6. top wall stiffening element 7. side wall stiffening element 8. top edge stiffening element 9. internal protrusion 10. beading 11. weakened zone 12. piercing element

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	<p>Mariller at Fig. 12:</p> <p>FIG 12</p>  <p>Panesar at p. 3, ll. 22–26:</p> <p>The insert may be a cartridge. . . . The lower surface may be a laminate. In this case, the inlet and outlet of the cartridge may be portions of the lower surface which are opened for transportation, in use, by piercing the lower surface.</p> <p>Panesar at p. 8, ll. 20–26:</p> <p>The beverage preparation machine 201 generally comprises a housing 210 containing a water tank 220, a water heater 225, a water pump 230, an air compressor 235, a control processor, a</p>

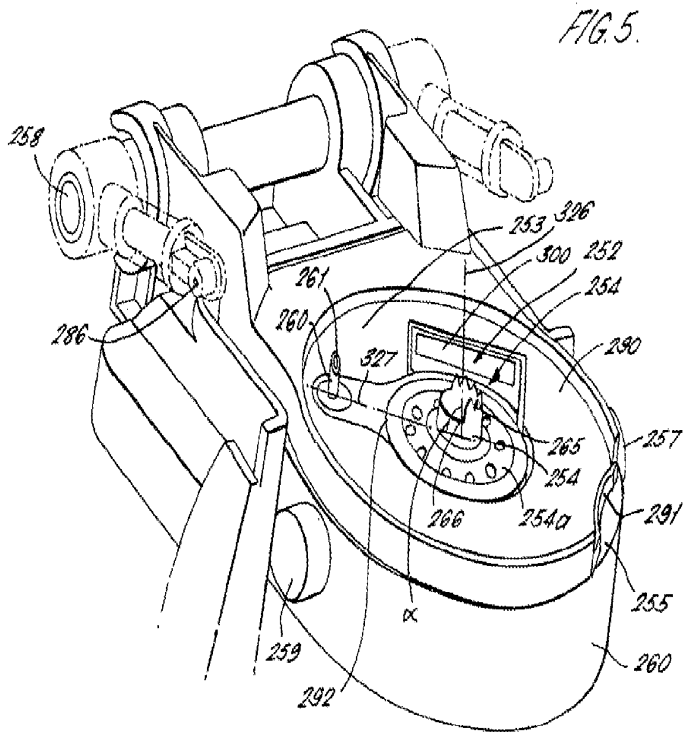
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	<p>user interface 240 and a brew head 250. The brew head 250 in turn generally comprises a 25 holder 251, recognition means 252 and inlet and outlet piercers 253, 254.</p> <p>Panesar at p. 9, ll. 9–18:</p> <p>[T]he cartridge 1 generally comprises an outer membrane 2, an inner member 3 and a laminate 5. The outer member 2, inner member 3 and laminate 5 are assembled to form the cartridge 1 which has an interior 120 for containing one or more beverage ingredients, an inlet 121, an outlet 122 and a beverage flow 15 path linking the inlet 121 to the outlet 122 and which passes through the interior 120. The inlet 121 and outlet 122 are initially sealed by the laminate 5 and are opened in use by piercing or cutting of the laminate 5.</p> <p>Panesar at p. 17, ll. 25–29:</p> <p>To use the cartridge 1 it is first inserted into the beverage preparation machine and the inlet 121 and outlet 122 are opened by piercing members of the beverage preparation machine which perforate and fold back the laminate 5.</p> <p>Panesar at p. 29 at line 3 – p. 30 at line 29:</p> <p>The lower part 255 comprises the inlet and outlet piercers 253, 254 and the head 300 of the cartridge recognition means 252. The inlet piercer 253 comprises a hollow needle-like tube 260 having a sharpened end 261 for perforating the laminate 5 of the beverage cartridge 1 in use. The inlet piercer 253 is in fluid communication with a water conduit 262 as shown in Figure 7 which passes through the lower part 255 and is connected to an outlet conduit 263 of the water heater 225. The outlet piercer 254 is similar in type to the outlet piercer described in the applicant's European patents EP 0 389 141 and EP 0 334 572 and comprises an open ended cylinder 264 of circular or D-shaped cross-section having dimensions larger than the discharge spout 43. An arcuate portion 265 of the upper end of the outlet piercer 254 is serrated to pierce and eventually cut the laminate of the beverage cartridge 1. The remainder of the upper end is cut back longitudinally of the cylinder at least to the base of the teeth 266</p>

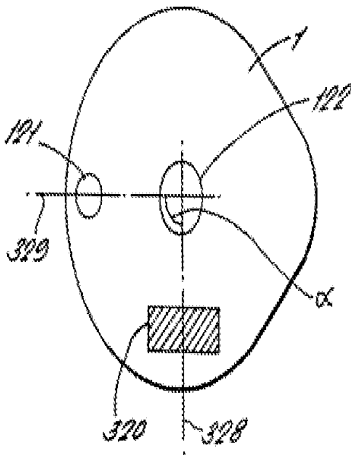
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	<p>of the serrated portion to fold or pull the cut laminate 5 away from the outlet aperture before the beverage is dispensed there through. The outlet piercer 254 pierces the laminate 5 externally of the discharge spout 43 and when the cartridge mount 257 is in the closed position, rests in the annulus between the discharge spout 43 and the outer wall 42 of the discharge funnel 40. The outlet piercer 254 folds back the cut laminate 105 into the annulus. Thereby both the outlet piercer 254 and the cut laminate 105 are held out of the way of the discharged beverage. The outlet piercer 254 is surrounded by a ledge 254a which is raised relative to its surroundings by 0.5mm. Advantageously, the outlet piercer 254 is removable from the lower part 255 to enable it to be thoroughly cleaned, for example, in a dishwasher. The removable outlet piercer 254 is received in a recess 267 in the lower part 255 where it is seated. The inlet piercer 253 and/or the outlet piercer 254 may be made of a metal, such as stainless steel, or from a plastics material.</p> <p>Panesar at p. 35 at line 32 – p. 33 at line 3:</p>

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	<p data-bbox="607 464 1286 497">During closure the inlet and outlet piercers 253, 254 pierce the laminate 5 of the cartridge 1 to form the cartridge inlet 121 and outlet 122.</p> <p data-bbox="607 520 763 554">Panesar at FIG. 5:</p>  <p data-bbox="607 1346 763 1379">Panesar at FIG. 4:</p>

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	<p style="text-align: center;"><i>FIG. 10.</i></p>  <p>Sweeney at Abstract:</p> <p>A beverage filter cartridge includes a cup-shaped outer container with a bottom and a side wall extending upwardly from the bottom wall to a circular rim surrounding an upper opening. The side wall has an upper section extending downwardly from the rim to an intermediate section, and a tapered lower section configured to provide a plurality of circumferentially spaced flutes extending downwardly from the intermediate section to the bottom wall. A filter element subdivides the interior of the container into first and second chambers. A beverage medium is stored in the first chamber. A cover is joined to the side wall at the rim to close the upper opening. The cover is yieldably piercable to accommodate an injection of liquid into the first chamber for combination with the beverage medium to produce a beverage. The filter element is permeable to accommodate a flow of the beverage from the first chamber into the second chamber, and the bottom wall is yieldably piercable to</p>

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	<p>accommodate an outflow of the beverage from the second chamber to the exterior of the cartridge.</p> <p>Sweeney at 1:19-32:</p> <p>This beverage filter cartridge is comprised basically of an impermeable yieldably-piercable cup-shaped outer container internally subdivided by a permeable cone-shaped filter into first and second chambers. A granular or powdered dry beverage medium, e.g., roasted ground coffee, is stored in the first chamber, and the container is closed by an impermeable yieldably piercable lid.</p> <p>During a processing cycle, the lid and container bottom are pierced, respectively, by tubular inlet and outlet probes. The inlet probe admits heated liquid under pressure into the first chamber for infusion with the beverage medium, and the resulting brewed beverage passes through the filter into the second chamber from which it exits via the outlet probe for delivery to an underlying cup.</p> <p>Sweeney at 4:20-23:</p> <p>The lid may be cut or blanked from any suitable impermeable heat sealable and yieldably piercable material, such as for example, a metallic/polymer laminate supplied by Winpak Heat Seal Packaging, Inc. of Montreal, Canada.</p> <p>Sweeney at 4:35-42:</p> <p>At the onset of a processing cycle, the lid 16 and container bottom 18 are pierced, respectively, by tubular inlet and outlet probes 28, 30 (see FIG. 3). The inlet probe 28 admits a heated liquid, typically hot water, into chamber A where it infuses and combines with the beverage medium M to produce a beverage. The beverage passes through the filter element 14 into chamber B, from which it exits via outlet probe 30.</p>

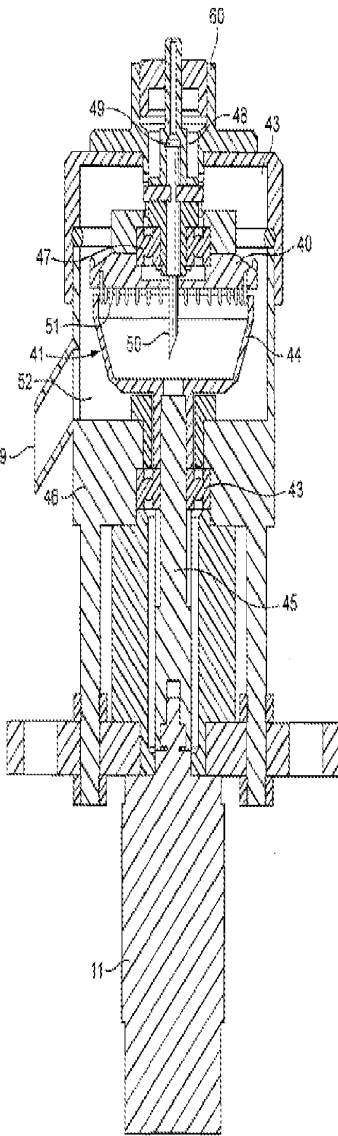
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U.S. Patent No. 10,858,177	Disclosure
	<p>Yoakim at [0019]:</p> <p>The enclosure is typically thermoformed of a food grade plastic and includes a top wall or lid that includes at least one inlet port defining a passage for receiving a liquid that is to be introduced into the capsule, with the inlet port aligned with the central axis of the capsule, wherein the liquid to be injected into the capsule is water and wherein the extractable or infusible ingredient(s) is ground coffee, soluble coffee, a dairy based powder, a dairy or non-dairy creamer, cocoa, a Sweetener, leaf tea, herbal tea, a culinary powder, a soluble or dispersible nutritional composition, a liquid food concentrate or combinations thereof.</p> <p>Yoakim at [00021]:</p> <p>The liquid introducing means preferably comprises at least one needle for injecting liquid into the capsule at or near its central axis. . . .</p> <p>Yoakim at [0186]:</p> <p>At the inside surface of the injection lid 40 is placed a piercing structure 450 which has the function of piercing the injection side 30 of the capsule. A water injector or lance 50 is provided which traverses the injection side 30 and which comprises an injection conduit for carrying water from the water circuit into the capsule. . . .</p> <p>Yoakim at [0219]-[0220]:</p> <p>The invention also relates to a food liquid preparation device for preparing a food liquid from a food substance contained in a single-use capsule, removably insertable in the device, bypassing water through the substance in the capsule, comprising a water injection head in the capsule and a capsule holder for holding the capsule in the device, characterized in that it</p>

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	comprises: a water injector, as part of the water injection head, arranged for introducing water along a central axis relative to the capsule holder Yoakim at FIG. 4:

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	 <p data-bbox="753 1619 829 1661">FIG. 4</p>

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	<i>See also e.g.,</i> Yoakim at FIGS. 35, 54, 55, 61, 62. <i>See also</i> [1], [4].

Appendix C – Obviousness Chart for U.S. Patent No. 10,870,531

U.S. Patent No. 10,870,531	Disclosure
<p>[1.pre] A method of using a portion capsule for producing a beverage, the method comprising:</p>	<p>The below cited art discloses, either expressly or inherently, a method of using a portion capsule for producing a beverage. <i>See, e.g.:</i></p> <p>Boyd at Abstract:</p> <p>A brewing packet is provided for use in the preparation of hot or cold beverages. The brewing packet envelops a brewing ingredient chosen according to the tastes of a beverage drinker. The packet includes a machine interpret-able feature that contains encoded data capable of being read by a beverage producing device. Furthermore, the data on the packet is capable of directing the beverage producing device to employ a specific brewing operation suited for the particular brewing packet. This allows for producing the optimal beverage from the brewing ingredient. The packet may be utilized with a variety of brewing ingredients to produce a variety of beverages. Similarly, the packet may be configured to produce single or multiple servings of a beverage.</p> <p>Boyd at [0006]:</p> <p>A brewing packet is provided for use in the preparation of hot or cold beverages. The brewing packet envelops a brewing ingredient chosen according to the tastes of a beverage drinker. The packet includes a machine interpret-able feature that contains encoded data capable of being read by a beverage producing device. Furthermore, the data on the packet may be capable of directing the beverage producing device to employ a specific brewing operation suited for the particular brewing packet. This allows for producing the optimal beverage from the brewing ingredient. The packet may be utilized with a variety of brewing ingredients to produce a variety of beverages. Similarly, the packet may be configured to produce single or multiple servings of a beverage.</p> <p>Boyd at [0019]-[0021]:</p> <p>Although the present invention may be used in virtually any brewing machine, it is described herein for use in the context of machines such as those disclosed in U.S. Pat. No. 5,974,949 to</p>

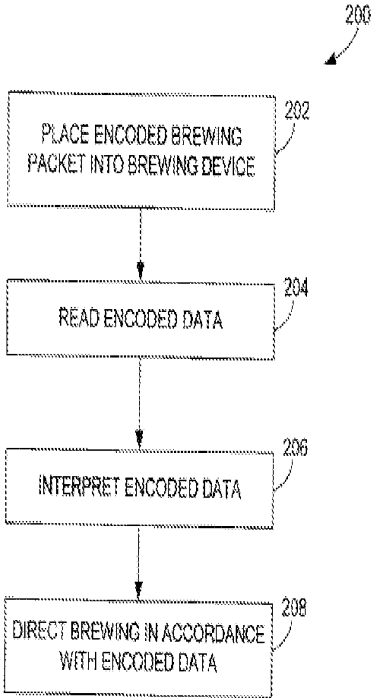
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	<p>Weber et al. and U.S. Pat. No. 6,035,762 to Ruckstuhl. Those patents disclose machines for brewing espresso using espresso packets in the form of filter capsules which are received through a funnel into a brewing chamber where water is passed through the filter capsule to produce an espresso beverage. The subject matter of each of these patents is incorporated herein by this reference.</p> <p>The invention also may be practiced in connection with espresso machines such as those disclosed in U.S. Pat. Nos. 4,253,385, 4,254,694, 4,353,293, 4,429,623, 4,484, 515, 4,555,894 and 4,852,333, all to Illy. These patents disclose various aspects of espresso machines which include brewing chambers configured to receive pre-fabricated espresso packets through which water is passed to produce an espresso drink. The subject matter of each of these patents also is incorporated herein by this reference.</p> <p>While the aforementioned machines generally are described for use in connection with espresso packets which contain a single serving of espresso, it will be appreciated that the present invention considers application of the relevant principles to machines which employ coffee packets for use in brewing multiple cups, which employ coffee packets of various size and shape, which employ various filter media and which contain coffee of various varieties, roasts, and grinds. Furthermore, the packet and methodology described herein may also produce other types of beverages such as tea, cider, and/or any beverage which is produced by mixing various ingredients. The packet and methodology is not limited to hot beverages and may be used to produce cold beverages.</p> <p>Boyd at [0034]-[0037]:</p> <p>Referring now to FIG. 4, a method of operation for the present invention is illustrated at 200. At 202, a brewing packet encoded with packet-characteristic data is placed into a brewing device. At 204, the packet-characteristic data is read by a sensor. At 206, the packet-characteristic data is interpreted by a processor. Finally, at 208, brewing is directed in accordance with the packet-characteristic data read by the sensor and interpreted by the processor.</p> <p>Because the processor may be employed to effect the aforementioned predefined brewing directives based on the machine interpretable feature associated with each packet. The</p>
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	<p>brewing operation may be made consistent based on consistent machine interpretable features from packet to packet. Similarly, the brewing operation may be altered in accordance with desired brewing characteristics each time the packet is replaced. Particular brew characteristics thus may be controlled simply by selection of a packet with the desired encoded brewing directives (whether or not such directives are known to the coffee machine operator). Control of the brewing process thus may be handed off to the brewing professionals who produce the packets, rather than relying on untrained machine operators. This may be done without sacrificing variety in brew operation based on differing characteristics of the packet contents or consumer tastes.</p> <p>For example, a person desiring weaker coffee may purchase packets designated such in order to direct the machine to add water to the brewed coffee beverage in accordance with proper brewing procedure. This avoids problems associated with ill-advised attempts to dilute coffee by decreasing the quantity of coffee used, a change which may result in a corresponding change in bed depth, and thus in an undesirable change in coffee taste.</p> <p>The encoded packets also may be used to track brewing information which may be useful in ensuring satisfaction with the brewed coffee beverage. For example, the packet may include an encoded date for use in tracking freshness of the coffee grounds contained within the packet. Upon determining that the packet is stale, the processor may direct the machine to note such staleness, thus avoiding an unsatisfactory beverage. Similarly, the packet may contain encoded data related to the coffee blend contained within the packet, such data being stored in memory to provide a history of coffee blends. The encoded packet also may contain encoded data defining the source of the packet so as to prohibit use of counterfeit packets, or packets from unauthorized suppliers.</p>
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	<p>Boyd at Fig. 4:</p>  <pre> graph TD 200 --> 202[PLACE ENCODED BREWING PACKET INTO BREWING DEVICE] 202 --> 204[READ ENCODED DATA] 204 --> 206[INTERPRET ENCODED DATA] 206 --> 208[DIRECT BREWING IN ACCORDANCE WITH ENCODED DATA] </pre> <p>FIG. 4</p> <p>See also Boyd at Claims 1-25.</p> <p>Jarisch at Abstract:</p> <p>Capsule for the preparation of a beverage comprising a container and a beverage ingredient contained therein, wherein the container comprises a code (65) adapted for being identified or read by external reading means (62), wherein the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule.</p> <p>Jarisch at [0014]:</p>
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	<p>The aim of the present invention is to propose an improved way to identify the capsule within a beverage production machine to ensure a more reliable and convenient retrieval or reading of information so as to adjust working parameters of the machine.</p> <p>Jarisch at [0023]:</p> <p>The invention further relates to a system for preparing a beverage from a capsule as aforementioned and further comprising a beverage preparation device; wherein the device comprises capsule holding means for holding the capsule and rotational drive means for driving the holding means and capsule in rotation along said axis of rotation and reading means arranged for reading the code when the capsule is rotated along said axis.</p> <p>Jarisch at [0034]:</p> <p>FIG. 1 illustrates an example of a beverage preparation system 1 as described in WO2010/026053 for which the capsule of the invention can be used.</p> <p>Jarisch at FIG. 1:</p>
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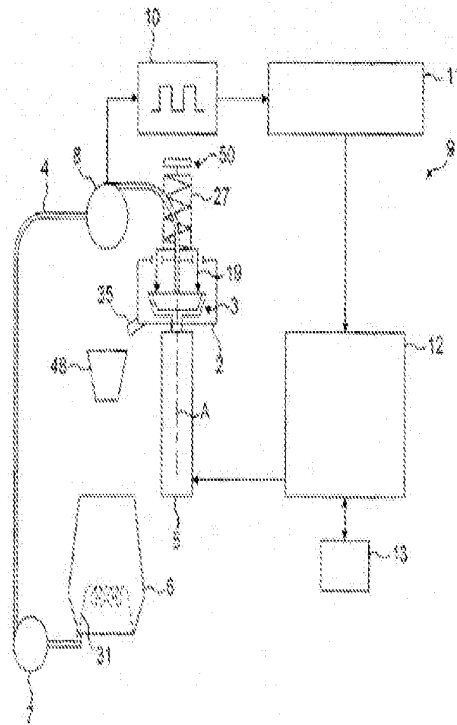


Fig. 1

Lazaris at Abstract:

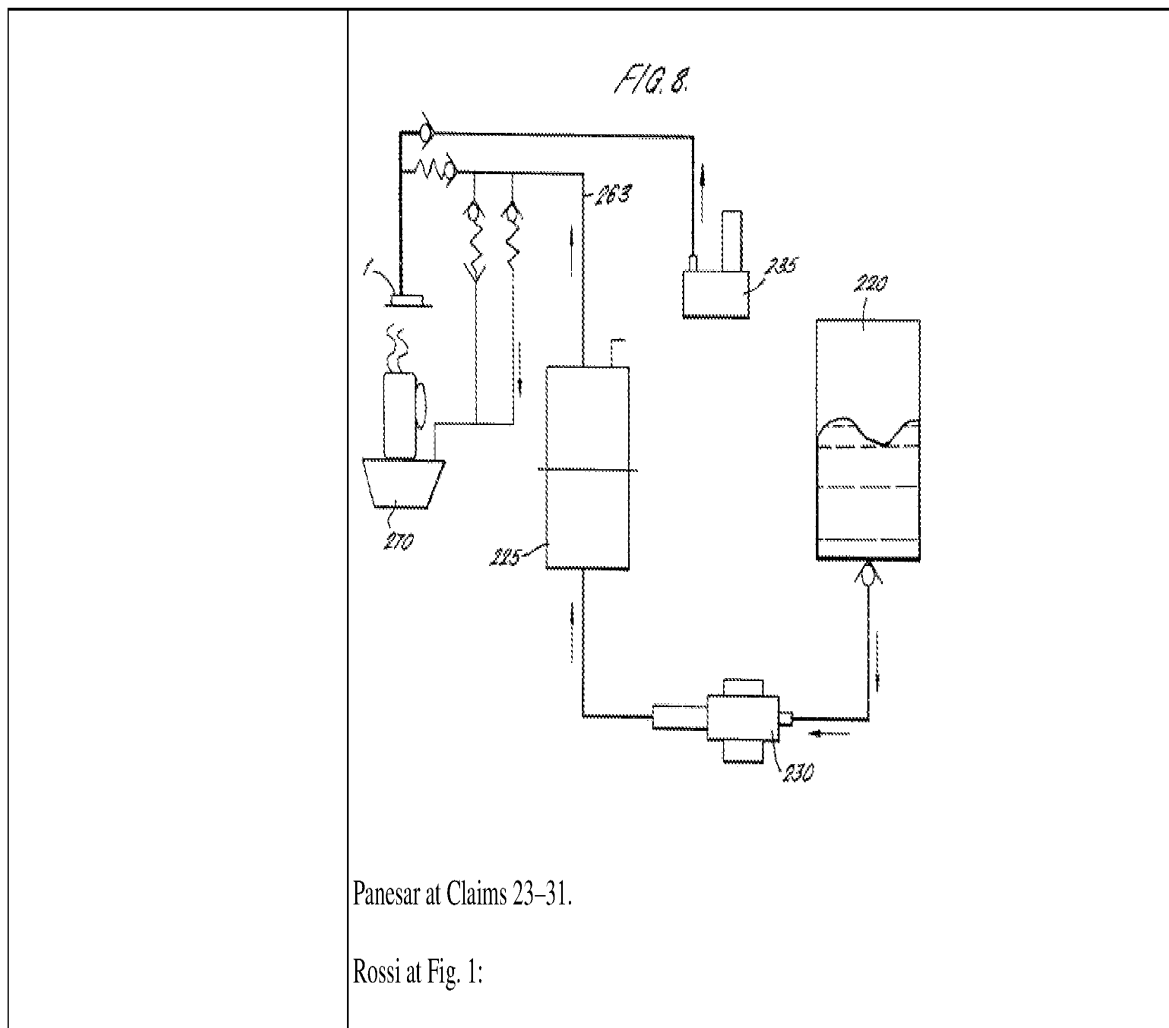
A brewer operates during a brew cycle to brew a beverage by infusing heated liquid with a dry beverage medium contained in a single serve disposable cartridge. During the brew cycle, the cartridge is contained in a cup-shaped housing closed by a lid. Rotation of the cartridge within the housing is resisted by locating surfaces arranged to interengage with at least one surface irregularity in the cartridge sidewall. Inlet and outlet probes pierce the cartridge and serve, respectively, to admit the heated liquid and to remove the served beverage.

Panesar at p. 1, ll. 4-5:

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	<p>The present invention relates to an insert, a machine and a system for the preparation of beverages.</p> <p>Panesar at p. 1, ll. 20–28:</p> <p>In the domestic market consumers may not wish to use separate machines when preparing beverages from different beverage ingredient containing containers or, indeed, loose beverage ingredients. It is therefore an object of the present 25 invention to provide an insert, a beverage preparation machine and a beverage preparation system which allows consumers to use a variety of containers or loose ingredients in a single beverage preparation machine.</p> <p>Panesar at p. 8, ll. 17–26; FIG. 8.</p> <p><u>Beverage Preparation System</u></p> <p>A beverage preparation machine 201 of the beverage preparation system of the present invention is shown in Figures 1a to 9b. The beverage preparation machine 201 generally comprises a housing 210 containing a water tank 220, a water heater 225, a water pump 230, an air compressor 235, a control processor, a user interface 240 and a brew head 250. The brew head 250 in turn generally comprises a holder 251, recognition means 252 and inlet and outlet piercers 253, 254.</p> <p>Panesar at FIG. 8:</p>
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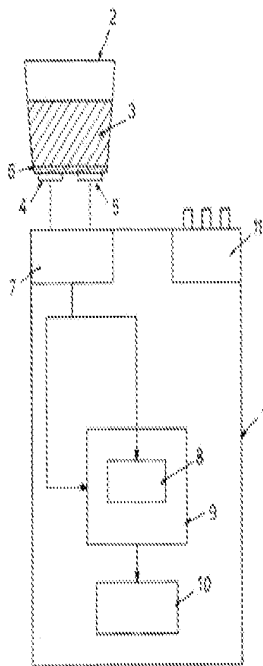


FIG. 1

Rossi at 1:

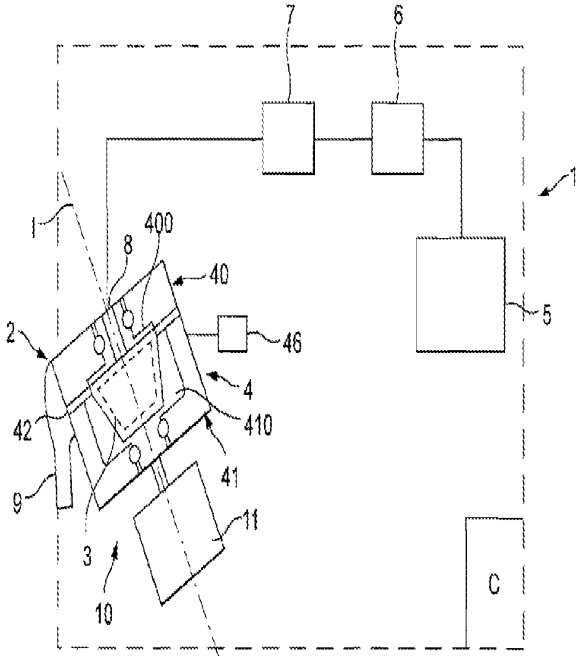
The present invention relates to a system of an edible- product making machine and a load element, and a process for controlling the operation of the edible-product making machine .

Edible-product making machines of the type being fed with a single use load element having a brewable or water soluble aromatic substance for preparation of said edible product are often used for the preparation of coffee, tea, or other beverages, as well as for soups. The load element generally comprises a capsule containing coffee powder, instant coffee granules, tea leaves, freeze-dried soup granules or other substances designed to be put in contact with water within machine. The load element is usually sealed, and the element is inserted into the machine, without the user being in contact with the substance therein. Inside the machine, the load element is generally pierced to allow water to pass through it, or the contents of the load element are emptied out into a different container for the preparation of the edible product.

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	<p>The contents of the load element are brewed or dissolved in the water in order to make the edible product.</p> <p><i>See also</i> Rossi at 3-6.</p> <p>Yoakim at [0002]:</p> <p>The present invention relates to a capsule, device, system, and method for preparing a beverage or food liquid from a food substance which is brewed or extracted by using centrifugal forces exerted on a capsule which contains the substance.</p> <p>Yoakim at [0139]-[0144]:</p> <p>The invention also concerns a system for preparing a beverage or food liquid from a food substance contained in a filtering receptacle by passing water through the substance using centrifugal forces . . . wherein the system further comprises referencing means for positioning and referencing the capsule in a removable manner in the device and in operational relationship with the water feed means and along an axis of rotation along the driving means.</p> <p>Yoakim at [0180]:</p> <p>The system 1 of the invention is illustrated in FIG. 1 in the more general sense. The system comprises a device 2 and a capsule 3. The device has a brewing module 4 into which the capsule can be inserted for being brewed and is removed after use for being discarded (e.g., for waste or recycling). The module is in fluid communication with a water reservoir 5 containing fresh or, alternatively heated water. A fluid transport means such as a low pressure pump 6 can be provided in the water circuit to transport water from the reservoir to the module. A water heater 7 is further provided to heat water to the desired temperature. It can be noted that water could be heated in the reservoir itself and water could be transported from the reservoir by effect of vaporization. Water can be fed into the module 4 at low or substantially no pressure. For example, a pressure between 0 and 2 bars above atmospheric pressure can be envisaged at the inlet 8 of the module.</p>
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	<p>See, e.g., FIG. 1:</p>  <p>FIG. 1</p> <p>w</p>
<p>[1.a] providing an apparatus including a barcode reader,</p>	<p>The below cited art discloses, either expressly or inherently, providing an apparatus including a barcode reader. See, e.g.:</p> <p>Boyd at [0006]:</p> <p>A brewing packet is provided for use in the preparation of hot or cold beverages. The brewing packet envelops a brewing ingredient chosen according to the tastes of a beverage drinker. The packet includes a machine interpretable feature that contains encoded data capable of being read by a beverage producing device. Furthermore, the data on the packet may be</p>

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	<p>capable of directing the beverage producing device to employ a specific brewing operation suited for the particular brewing packet. This allows for producing the optimal beverage from the brewing ingredient. The packet may be utilized with a variety of brewing ingredients to produce a variety of beverages. Similarly, the packet may be configured to produce single or multiple servings of a beverage.</p> <p>Boyd at [0019]-[0021]:</p> <p>Although the present invention may be used in virtually any brewing machine, it is described herein for use in the context of machines such as those disclosed in U.S. Pat. No. 5,974,949 to Weber et al. and U.S. Pat. No. 6,035,762 to Ruckstuhl. Those patents disclose machines for brewing espresso using espresso packets in the form of filter capsules which are received through a funnel into a brewing chamber where water is passed through the filter capsule to produce an espresso beverage. The subject matter of each of these patents is incorporated herein by this reference.</p> <p>The invention also may be practiced in connection with espresso machines such as those disclosed in U.S. Pat. Nos. 4,253,385, 4,254,694, 4,353,293, 4,429,623, 4,484, 515, 4,555,894 and 4,852,333, all to Illy. These patents disclose various aspects of espresso machines which include brewing chambers configured to receive pre-fabricated espresso packets through which water is passed to produce an espresso drink. The subject matter of each of these patents also is incorporated herein by this reference.</p> <p>While the aforementioned machines generally are described for use in connection with espresso packets which contain a single serving of espresso, it will be appreciated that the present invention considers application of the relevant principles to machines which employ coffee packets for use in brewing multiple cups, which employ coffee packets of various size and shape, which employ various filter media and which contain coffee of various varieties, roasts, and grinds. Furthermore, the packet and methodology described herein may also produce other types of beverages such as tea, cider, and/or any beverage which is produced by mixing various ingredients. The packet and methodology is not limited to hot beverages and may be used to produce cold beverages.</p>
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	<p>Boyd at [0023]:</p> <p>With the foregoing in mind, it will be appreciated that it would be desirable to automatically customize the brew operation based on particular characteristics of the packet, the characteristics of the coffee, and/or the tastes of the user, whether or not the user is aware of what changes in the brew operation will lead to the desired taste. The present invention provides a vehicle for such customization in the form of an encoded packet configured to provide the brewing machine with data useful in directing the brewing operation in accordance with packet or packet content characteristics and/or the user's tastes.</p> <p>Boyd at [0028]:</p> <p>As shown in FIG. 2, packet 10 includes a machine interpretable feature 30 which directs operation of the coffee machine in accordance with predefined brewing directives. In the first depicted embodiment, the machine interpretable feature is a barcode 31 as depicted in FIG. 2 and 2a. It will be understood that the machine interpretable feature may be any machine readable feature associated with packet 10.</p> <p>Boyd at [0030]:</p> <p>Machine interpretable feature 30, it will be appreciated, is capable of storing a significant amount of data, including specific brewing directives and/or packaging or ingredient characteristics. Examples of the types of brewing directives stored in machine interpretable feature 30 may include, for example, contact time, contact pattern, fluid volume, fluid temperature, fluid pressure, and/or fluid pass-through rate. The above brewing directives are all well known in the coffee brewing industry to affect the taste and quality of the coffee beverage. Examples of ingredient characteristics which may be stored in machine interpretable feature 30 include grind, blend, roast, quantity, bed depth, freshness, and expiration date. These examples are meant to be exemplary, not limiting in scope.</p> <p>Boyd at [0032]-[0034]:</p> <p>Coffee machine 100 includes a sensor 130 designed to read machine interpretable feature 30 of packet 10. Sensor 130 is in turn operatively connected to a processor 140 which controls</p>
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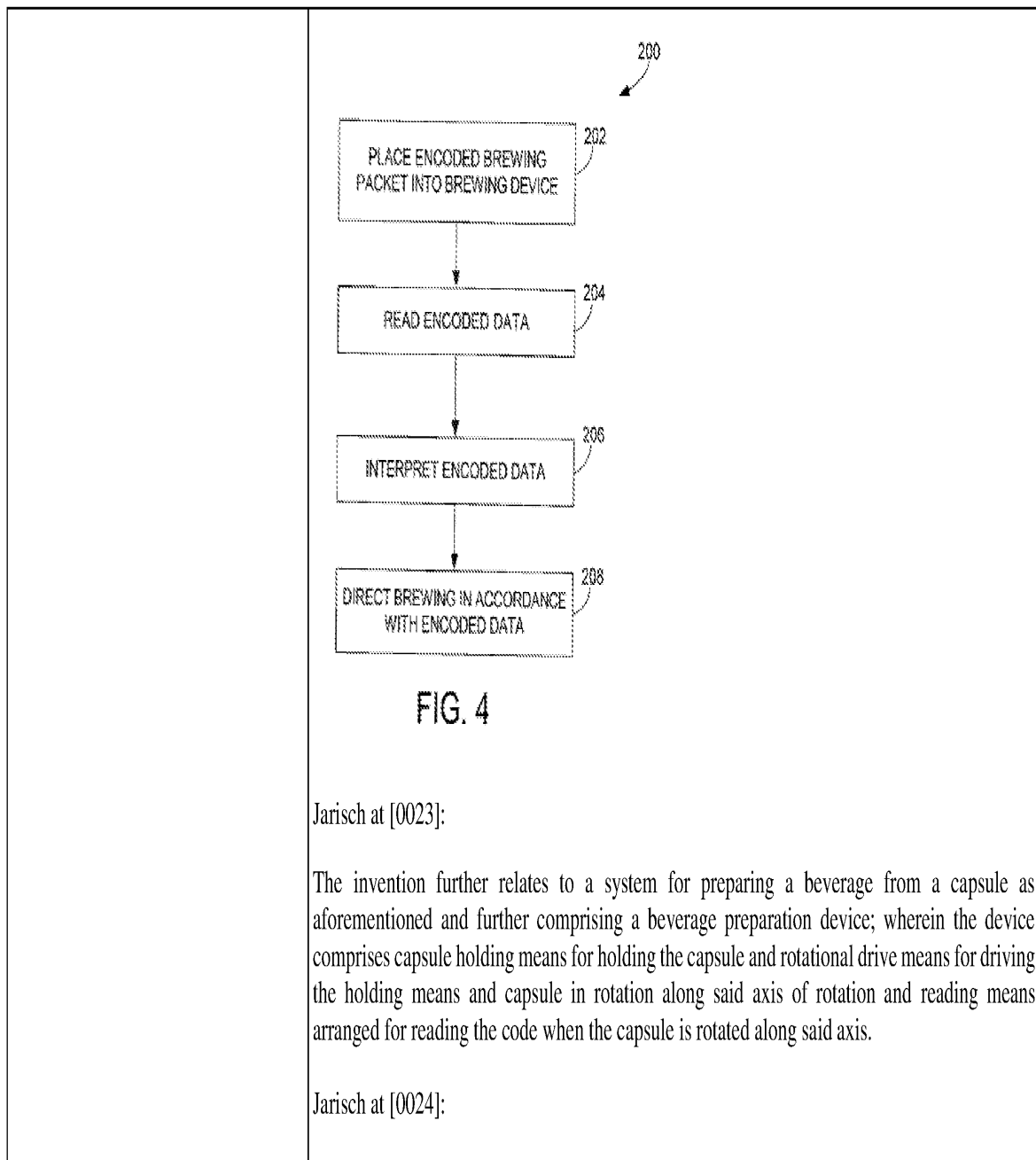
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	<p>coffee machine 100. Machine interpretable feature 30 may store data which is read by sensor 130 and passed to processor 140. Processor 140 may then direct the brewing operation in accordance with its interpretation of the data derived from machine interpretable feature 30. For example, processor 140 may direct coffee machine 100 to brew using a pre-selected contact time, contact pattern, fluid quantity, fluid temperature, fluid pressure, and/or fluid pass-through rate expressed in machine interpretable feature 30. Alternatively, the processor may itself make determinations of contact time, contact pattern, fluid quantity, fluid temperature, fluid pressure, and/or fluid pass-through rate based on information contained in machine interpretable feature 30. The processor may also, based on information contained in machine interpretable feature 30, direct the coffee machine to add water, milk, cream, sugar, or any suitable condiment to the coffee beverage.</p> <p>As alluded to above, machine interpretable feature 30 need not store data specifically including brewing directives and ingredient characteristics. Instead machine interpretable feature 30 may act as an identifier so that brewing directives and ingredient characteristics may be looked up from data storage 150 within (or external to) coffee machine 100. Sensor 130 thus may read machine interpretable feature 30 and processor 140 may match the machine interpretable feature with predefined brewing operation instructions stored in such memory. Processor 140 may then direct the brewing operation based on brewing operation instructions. In one embodiment, the brewing operation instructions are matched to a machine interpretable feature using a look-up table in which brewing operation instructions correspond in a one-to-one ratio with each known ingredient variety, packet size, packet construction, user preference, etc. It will be appreciated, however, that other arrangements for matching machine interpretable feature 30 with brewing directives similarly may be used.</p> <p>Referring now to FIG. 4, a method of operation for the present invention is illustrated at 200. At 202, a brewing packet encoded with packet-characteristic data is placed into a brewing device. At 204, the packet-characteristic data is read by a sensor. At 206, the packet-characteristic data is interpreted by a processor. Finally, at 208, brewing is directed in accordance with the packet-characteristic data read by the sensor and interpreted by the processor.</p>
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	<p>Boyd at Fig. 3:</p> <p>FIG.3</p> <p>Boyd at Fig. 4:</p>
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	<p>In particular, the reading means may comprise a light emitter and a light sensor. In an alternative, the reading means comprises an inductive sensor. The optical reading means or inductive sensor may be arranged to detect a code on the rim of the capsule.</p> <p>Jarisch at [0071]-[0073]:</p> <p>The reader may consist of:</p> <ul style="list-style-type: none"> • A light source with/without focusing optic, and • A light sensor with/without focusing optic. <p>Jarisch at [0082]:</p> <p>In the embodiment of the figure 4, the light source is placed at the bottom of the centrifugal cell 3. This cell is light conductive allowing the beam to reach the bottom side 72 of its rim 73. The reflected light is conducted by the transparent (or light conductive) centrifugal cell 3 to reach the sensor 62. In case that the sensor 62 cannot be aligned with the transparent part of the centrifugal cell 3, a mirror can be placed as illustrated in the figure 4 to deflect the forward and backward beams.</p> <p><i>See also Jarisch at Claims 14-16; FIGs. 2-7.</i></p> <p>Lazaris at [0042]:</p> <p>It is contemplated that the housings may be mounted such that they do not pivot to automatically eject the cartridges at the end of the brewing cycle, thus requiring users to manually remove the used cartridges. The holder may also employ multiple inlet probes to increase liquid distribution within the cartridge. The inlet probes also may have different heights to improve saturation of the beverage medium within the cartridge. It is also contemplated that the brewer may include a control system for automatically determining the type of cartridge (e.g., the beverage medium within the cartridge) and adjust the brewing cycle accordingly. This may include providing machine readable data such as bar codes, data matrixes, dielectric encoding, etc, on a portion of the cartridge exterior accessible to a corresponding reader in the brewer.</p>
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	<p>Mahlich at [0008]:</p> <p>It is thus the task of the present invention to equip the actual single-serving units to be selected with suitable machine readable identification whereby complicated voluminous double mirror scanners are not required for reading the identification code and whereby the accurate alignment of the single-serving pouch with regard to the scanner or its reading unit does not matter. In particular, the difficult process of aligning a rotation-symmetrical single-serving unit, whereby the shape of the capsule is mainly frustoconical and the pouch is mainly lozenge-shaped, is thus eliminated.</p> <p>Mahlich at [0010]:</p> <p>According to the invention, direct scanning or immediate reading of the identification on the single-serving unit, particularly of the single-serving capsule itself and not of any part of the storage magazine adjacent to the capsule, guarantees that the selected type of coffee is correctly identified with the single-serving unit and is actually being brewed after removal of the single-serving unit from the storage magazine. The identification can be read easily and accurately via an uncomplicated and compact reading head able to read in a linear manner, provided that the reading head is able to register the rotation-symmetrical identification. However, the rotational or angular position of the rotation-symmetrical identification with regard to the reading head that reads in a linear manner is not important, whereby the alignment of the single-serving unit with regard to the reading head is greatly simplified. In addition, the rotation-symmetrical identification is suitable for testing via a simple procedure according to claim 12.</p> <p>Mahlich at [0014]-[0016]:</p> <p>Apart from coffee type identification, the identification on any single-serving unit may also contain producer identification, whereby the latter in conjunction with an adapted evaluation system for controlling the espresso machine can block operation of the espresso machine if the producer identification on the single-serving unit does not correspond to the machine's preprogrammed producer identification.</p>
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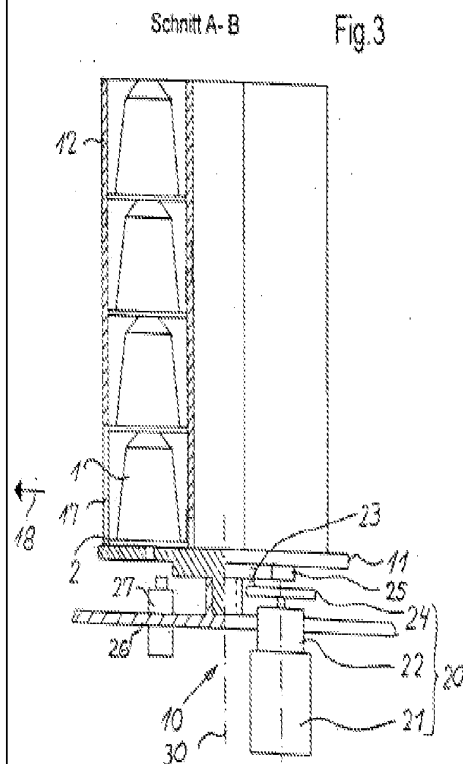
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	<p>As mentioned above, an uncomplicated system for the registration of the machine readable identification on a single-serving unit according to the invention may consist of a registration device with at least one reading head able to read in a linear manner. The reading head comprises a reading sensor consisting of a transmitter scanning a luminous spot on the identification or part thereof, and of a decoder receiver. The latter may be equipped with a controlling device whereby the setting, particularly that of a magazine unit, can be controlled in order to convey the single-serving units containing the desired coffee type into the dispensing position.</p> <p>According to claim 7 the linear reading head is located in a compact and secure position below the magazine tubes of the magazine unit. The reading head is directed upwards towards the plane where the bases of the single-serving capsules are positioned within the magazine tubes, in such a way that the rotation-symmetrical identification on the base of the respective lowest single-serving capsule can be read.</p> <p>Mahlich at [0037]</p> <p>The support frame 26 also carries a reading head 27 mainly consisting of a scan transmitter and an encoder receiver. Reading head 27 is pointing from below towards the turntable 11 in such a way that it is able to register and scan the single-serving capsules stacked with their base facing downwards inside the magazine tubes 12 to 16 when the magazine tubes are moved across the reading head 27.</p> <p>For this purpose at least part of turntable 11 is transparent to the scanning of the ID code: windows 29 located below the magazine tubes 12 to 16 are designed as slits and are each arranged at equal radial distance to a main axis 30 of turntable 11, cf. FIG. 3. The ID codes 3 on the bases 2 of the single-serving capsules can be registered across their greatest radius r_1 and r_2 through these slits, according to FIG. 1a. In this case ID code 3 is being registered on entering and on leaving the reading station when the base 2 of the capsule, equipped with the ID code, passes on its circular path across reading head 27 arranged in front of dispensing station 18 in the direction of rotation 28 of the turntable. It is thus guaranteed, via comparison of the two registered ID codes as well as via data processing, that only one single-serving</p>
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capsule 1 containing the desired coffee type is conveyed to the dispensing station 18, once the desired coffee type has been selected, for example by means of a control panel or a knob.

Mahlich at Fig. 3:



See also Mahlich at Claims 1-12.

Panesar at p. 4, ll. 24-29:

The beverage preparation machine may comprise a brew head comprising an upwardly directed inlet for supplying water to the brew head, a downwardly directed outlet for outflow of beverage produced by the machine and a barcode or RFID reader having a window in the brew head through which signals may be transmitted . . .

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	<p>Panesar at p. 5, ll. 7–8:</p> <p>Preferably the barcode reader or RFID reader window is located at or near a periphery of the brew head.</p> <p>Panesar at p. 34, ll. 5–26:</p> <p>The purpose of the recognition means 252 is to allow the machine 201 to recognize the type of beverage cartridge 1 that has been inserted and to adjust one or more operational parameters accordingly. In a typical embodiment, the recognition means 252 comprises an optical barcode reader which reads the printed barcode 320 provided on the laminate 5 of the beverage cartridge 1 as shown in Figure 10 and discussed above. The optical barcode reader comprises one or more LEDs 321 to illuminate the barcode 320, a focusing lens 322 to acquire an image of the barcode, a charge coupled device (CCD) 323 for producing an electrical signal representative of the acquired image and support circuitry for the LEDs and CCD. The space in the lower part for accommodating the barcode reader is limited. A mirror or mirrors 324 may be used to reflect the light from the LEDs 321 to a focusing lens which is not located in the lower part 255. Schematic arrangements are shown in Figures 9a and 9b. The lower part 255 comprises an aperture 326 which is the same size as the barcode 320 on the beverage cartridge 1. The aperture 326 is closed by a window, preferably glass, which can transmit the signals produced by the barcode reader.</p> <p>Panesar at p. 35, ll. 4–6:</p> <p>Alternatively, an RFID reader is provided to read an RFID located on the cartridge 1.</p> <p>Panesar at FIG. 5:</p>
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	<p style="text-align: right;"><i>FIG. 5.</i></p> <p>Panesar at Claims 24, 27, 30.</p> <p>Rossi at Abstract:</p> <p>The process for controlling the operation of an edible-product making machine (1) of the type being fed with a single use load element (2) having a brewable or water soluble aromatic substance (3) for preparation of the edible product, comprises a first step of recognition wherein the edible-product making machine (1) recognises an identifying element (4) on the load element (2) allowing the edible-product making machine (1) to take further steps only if it also recognises on the load element (2) a validation element (5) to be validated, a second step of validation of the validation element (5), and a third step of activation wherein the edible-product making machine (1) automatically activates a cycle of production of the edible product only after having recognised on the load element (2) the identifying element (4) in combination with the validation element (5) as validated.</p>
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Rossi at Fig. 1:

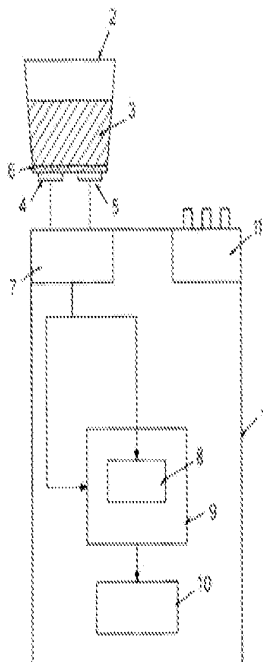


FIG 1

Rossi at 4:

The technical task, as well as these and other objects, are achieved according to the present invention by a process for controlling the operation of an edible-product making machine of the type being fed with a single use load element having a brewable or water soluble aromatic substance for preparation of said edible product, characterised in that it comprises a first step of recognition wherein said edible-product making machine recognises an identifying element on said load element allowing said edible-product making machine to take further steps only if it also recognises on said load element a validation element to be validated, a second step of validation of said validation element, and a third step of activation wherein said edible-product making machine automatically activates a cycle of production of said edible product

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	<p>only after having recognised on said load element said identifying element in combination with said validation element as validated.</p> <p>Rossi at 6:</p> <p>The process of the present invention comprises a first step of the edible-product making machine recognising an identifying element on the load element. This can optionally be through an infra red (IR) wave communication channel, a radio frequency (RF) wave communication channel, or an optical wave communication channel. The user may hold the identifying element on the load element up against recognition means located externally on the edible-product making machine.</p> <p>Rossi at 9:</p> <p>The load element of the system comprises an identifying element for its recognition and a validation element for its validation. These are preferably in the form of barcodes, antennae, or paints having optically measurable properties. The machine comprises means for recognising the load element and the validation element, such as at least one infra red barcode reader, radio frequency wave transmitter and receiver, or optical sensor. These are preferably located externally on a lateral wall of the capsule, externally on the protective packaging of the capsule, or externally on the protective sheet on the outlet base of the capsule.</p> <p>Rossi at 10:</p> <p>Figure 1 shows a schematic view of one embodiment of the system of the present invention.</p> <p>With reference to the above figure, the system comprises an edible-product making machine 1 and a single use load element in the form of a capsule 2. The load element contains a brewable or water soluble aromatic substance 3 for preparation of an edible product. The capsule 2 comprises an identifying element in the form of a barcode 4 and a validation element also in the form of a barcode 5, both located externally on a protective sheet 6 of the outlet base of the capsule. The machine 1 comprises recognising means in the form of an infrared barcode reader 7. This is connected to checking means 8 stored within a control unit 9 of the machine. The checking means allow the machine activation means 10 to be engaged</p>
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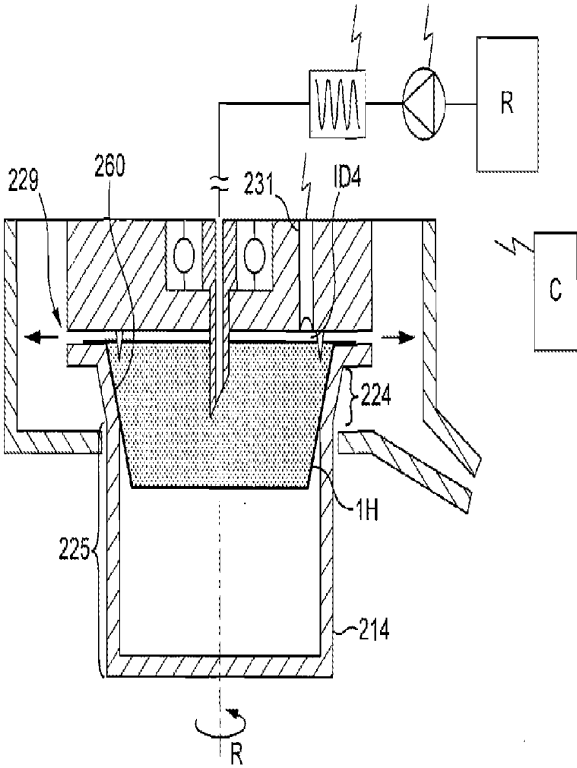
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	<p>only if the barcode reader 7 recognises the identification barcode 4 and the validation barcode 5. The machine 1 further comprises validation means in the form of a mechanical tool 11 having a plurality of tips for destroying the validation barcode 5, for example by ripping, cutting, scratching or piercing, such that the barcode reader 7 cannot recognise it as an unvalidated validation barcode. If, after the positive signal from the checking means 8 from the first recognition of the identification and validation barcodes 4,5, the barcode reader 7 performs a second recognition of the identification barcode 4 combined with the validated validation barcode 5, the activation means 10, connected to the barcode reader 7 through the control unit 9, automatically activate a cycle of production of the edible product.</p> <p>Rossi at Claim 15.</p> <p>Yoakim at [0025]:</p> <p>The device is useful for preparing beverages from a plurality of different capsules, in which case it further comprises identification means for identifying the different capsules, and control means capable of operating the device in centrifugation for any of the different capsules according to predetermined liquid food preparation parameters including the flow rate and the volume of liquid to be injected into the capsule, with the identification means comprising capsule recognition means which are recognized by sensing means connected to the control means of the device to control the preparation parameters accordingly.</p> <p>Yoakim at [0192]:</p> <p>Therefore, as much as two, three, four or even more different flow rates and/or speed ranges can be provided in function of the types of coffee to be delivered. Therefore, depending on the types of beverage to be brewed, the control unit can be programmed to adjust the optical centrifugal conditions. For instance, the control unit may be associated to a capsule recognition system enabling to recognize the types of capsules, i.e., espresso, lungo, cappuccino, long coffee (e.g., 180-400 ml), latte, tea, etc., and to adjust the speed and/or other brewing parameters (e.g., water temperature) according the capsule which is inserted in the device. A recognition system uses a code on the capsule and recognized by the device, such as a color, a barcode, an RFID, a magnetic code, ferromagnetic micro-wires or labels, shapes and combinations thereof.</p>
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	<p>Yoakim at [0477]:</p> <p>The capsule system further comprises an identification means associated to the different capsules in the set for identifying each capsule and adjusting brewing parameters accordingly. The adjustable parameters can be the rotational speed, the back-pressure at the outlet of the capsule, and/or the volume of liquid fed in the capsule. The identification means participates to deliver a wider range of beverages having differentiated characteristics (volume, taste, strength, crema, colour, etc.). The identification means are associated to control means placed in the centrifugal brewing device which controls the adjustment of the said parameters, by controlling the rotational motor driving the capsule holder or/and the pump supplying liquid in the capsule.</p> <p>Yoakim at [0494]-[0496]:</p> <p>The identification means can be sensed by sensing means connected to the control means for an active control of the parameters or can be passive identification means, e.g., selective flow restriction means. In particular, the identification means comprises capsule recognition means which are recognized by the sensing means connected to the control means of the brewing device which controls the brewing parameters accordingly. The recognition means can be differentiable by a visual code such as a barcode, a colour, a sign, a logo, etc., or by a radio-frequency (RFID), a magnetic element or by an identifiable shape.</p> <p>Yoakim at [0525]:</p> <p>In an alternative illustrated in FIGS. 61 and 62, the identification means are directly associated to the different capsules. In this case, the identification means ID4 and ID5 are capsule recognition means attached to or embedded in the capsules. The recognition means can be any mechanical, optical, magnetic, or radio-frequency recognition means capable of delivering information to the brewing device, via a sensing device 231, as to which type of capsule is inserted in the device. For example, the recognition means is a barcode, a colour code, a RFID tag, a magnetically sensitive element, or a mechanical key or shape.</p>
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	<p>Yoakim at FIG. 61:</p>  <p>FIG. 61</p>
<p>[1.b] the apparatus including a pump adapted to supply heated water;</p>	<p>The below cited art discloses, either expressly or inherently, the apparatus including a pump adapted to supply heated water. <i>See, e.g.:</i></p> <p>Boyd at [0003]:</p> <p>Automated coffee machines have long been used for brewing coffee, both in large-scale commercial settings and in smaller business and home settings. These machines typically</p>

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	<p>operate on the principle of placing a quantity of ground coffee into a filter, and passing hot water through the ground coffee to produce a coffee beverage.</p> <p>Boyd at [0006]:</p> <p>A brewing packet is provided for use in the preparation of hot or cold beverages. The brewing packet envelops a brewing ingredient chosen according to the tastes of a beverage drinker. The packet includes a machine interpretable feature that contains encoded data capable of being read by a beverage producing device. Furthermore, the data on the packet may be capable of directing the beverage producing device to employ a specific brewing operation suited for the particular brewing packet. This allows for producing the optimal beverage from the brewing ingredient. The packet may be utilized with a variety of brewing ingredients to produce a variety of beverages. Similarly, the packet may be configured to produce single or multiple servings of a beverage.</p> <p>Boyd at [0019]-[0021]:</p> <p>Although the present invention may be used in virtually any brewing machine, it is described herein for use in the context of machines such as those disclosed in U.S. Pat. No. 5,974,949 to Weber et al. and U.S. Pat. No. 6,035,762 to Ruckstuhl. Those patents disclose machines for brewing espresso using espresso packets in the form of filter capsules which are received through a funnel into a brewing chamber where water is passed through the filter capsule to produce an espresso beverage. The subject matter of each of these patents is incorporated herein by this reference.</p> <p>The invention also may be practiced in connection with espresso machines such as those disclosed in U.S. Pat. Nos. 4,253,385, 4,254,694, 4,353,293, 4,429,623, 4,484, 515, 4,555,894 and 4,852,333, all to Illy. These patents disclose various aspects of espresso machines which include brewing chambers configured to receive pre-fabricated espresso packets through which water is passed to produce an espresso drink. The subject matter of each of these patents also is incorporated herein by this reference.</p> <p>While the aforementioned machines generally are described for use in connection with espresso packets which contain a single serving of espresso, it will be appreciated that the</p>
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	<p>present invention considers application of the relevant principles to machines which employ coffee packets for use in brewing multiple cups, which employ coffee packets of various size and shape, which employ various filter media and which contain coffee of various varieties, roasts, and grinds. Furthermore, the packet and methodology described herein may also produce other types of beverages such as tea, cider, and/or any beverage which is produced by mixing various ingredients. The packet and methodology is not limited to hot beverages and may be used to produce cold beverages.</p> <p>Boyd at [0024]:</p> <p>Focusing now particularly on the invented encoded coffee packet, it will be appreciated that such packet typically takes the form of a coffee-filled packet configured for placement in a fluid path of a coffee machine whereby hot water (or steam) flows through the packet to produce a coffee beverage. An exemplary packet is depicted in FIGS. 1-3, such packet being indicated generally at 10.</p> <p>Jarisch at [0035]:</p> <p>The centrifugal unit 2 comprises a centrifugal cell 3. The cell 3 may comprise a capsule holder and a capsule received therein. The centrifugal unit is connected to driving means 5 such as a rotary motor. The centrifugal unit comprises a collecting part and an outlet 35. A receptacle 48 can be disposed below the outlet to collect the extracted beverage. The system further comprises liquid supply means such as a water reservoir 6 and a fluid circuit 4. Heating means 31 may also be provided in the reservoir or along the fluid circuit. The liquid supply means may further comprise a pump 7 connected to the reservoir. A flow restriction means 19 is provided to create a restriction to the flow of the centrifuged liquid which leaves the capsule. The system may further comprise a flow meter such as a flow-metering turbine 8 for providing a control of the flow rate of water supplied in the cell 3. The counter 11 can be connected to the flow-metering turbine 8 to enable an analysis of the generated impulse data 10. The analysed data is then transferred to the processor 12. Accordingly, the exact actual flow rate of the liquid within the fluid circuit 4 can be calculated in real-time. A user interface 13 may be provided to allow the user to input information that is transmitted to the control unit 9. Further characteristics of the system can be found in WO2010/026053.</p>
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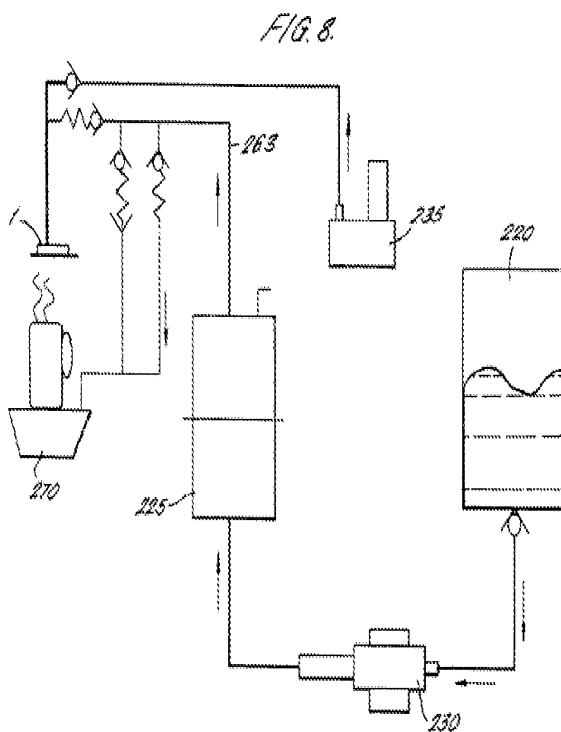
	<p>Panesar at p. 8, ll. 17–26:</p> <p><u>Beverage Preparation System</u></p> <p>A beverage preparation machine 201 of the beverage preparation system of the present invention is shown in Figures 1a to 9b. The beverage preparation machine 201 generally comprises a housing 210 containing a water tank 220, a water heater 225, a water pump 230, an air compressor 235, a control processor, a user interface 240 and a brew head 250. The brew head 250 in turn generally comprises a holder 251, recognition means 252 and inlet and outlet piercers 253, 254.</p> <p>Panesar at p. 23, ll. 23–32:</p> <p>The water pump 230 is operatively connected between the water tank 220 and the water heater 225 as shown schematically in Figure 8 and is controlled by the control processor. The pump provides a maximum flow rate of 900 ml/min of water at a maximum pressure of 2.5 bar. Preferably, in normal use, the pressure will be limited to 2 bar. The flow rate of water through the machine 201 can be controlled by the control processor to be a percentage of the maximum flow rate of the pump by cycle chopping the electrical supply to the pump.</p> <p>Panesar at p. 24, ll. 10–14:</p> <p>The water heater 225 is located in the interior of the housing 210. The heater 225 has a power rating of 1550 W and is able to heat water received from the water pump 230 from a starting temperature of approximately 20 °C to an operating temperature of around 85 °C in under 1 minute.</p> <p>Panesar at p. 25, ll. 8–29:</p> <p>The control processor of the beverage preparation machine 201 comprises a processing module and a memory. The control processor is operatively connected to, and controls operation of, the water heater 225, water pump 230, air compressor 235 and user interface 240.</p>
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The memory of the control processor includes one or more variables for one or more operational parameters for the beverage preparation machine 201. The operational parameters are the temperature of the water passed through the beverage cartridge 1 during the operating stage, the speed of charging the beverage cartridge 1, the presence or otherwise of a soak step, the total dispensed volume of the beverage, the flow rate of the water during the discharge stage, and the flow rate and period of the purge stage.

The variables for the operational parameters are stored in the memory. The cartridge 1 comprises a code provided on or in the cartridge 1 representing the operational parameters required for optimal dispensation of the beverage in that cartridge 1. The code is in binary format and comprises a plurality of data bits corresponding to the variables stored in the control processor memory.

Panesar at FIG. 8:



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	<p>Yoakim at [0180]:</p> <p>The module is in fluid communication with a water reservoir 5 containing fresh or, alternatively heated water. A fluid transport means such as a low pressure pump 6 can be provided in the water circuit to transport water from the reservoir to the module. A water heater 7 is further provided to heat water to the desired temperature. It can be noted that water could be heated in the reservoir itself and water could be transported from the reservoir by effect of vaporization. Water can be fed into the module 4 at low or substantially no pressure. For example, a pressure between 0 and 2 bars above atmospheric pressure can be envisaged at the inlet 8 of the module.</p>
<p>[1.c] inserting the portion capsule into the apparatus, the portion capsule including a foil lid sealed to a base element having a cavity in which a beverage raw material is provided,</p>	<p>The below cited art discloses, either expressly or inherently, inserting the portion capsule into the apparatus, the portion capsule including a foil lid sealed to a base element having a cavity in which a beverage raw material is provided. <i>See, e.g.:</i></p> <p>Boyd at [0006]:</p> <p>A brewing packet is provided for use in the preparation of hot or cold beverages. The brewing packet envelops a brewing ingredient chosen according to the tastes of a beverage drinker. The packet includes a machine interpretable feature that contains encoded data capable of being read by a beverage producing device. Furthermore, the data on the packet may be capable of directing the beverage producing device to employ a specific brewing operation suited for the particular brewing packet. This allows for producing the optimal beverage from the brewing ingredient. The packet may be utilized with a variety of brewing ingredients to produce a variety of beverages. Similarly, the packet may be configured to produce single or multiple servings of a beverage.</p> <p>Boyd at [0028]:</p> <p>As shown in FIG. 2, packet 10 includes a machine interpretable feature 30 which directs operation of the coffee machine in accordance with predefined brewing directives. In the first depicted embodiment, the machine interpretable feature is a barcode 31 as depicted in FIG. 2</p>

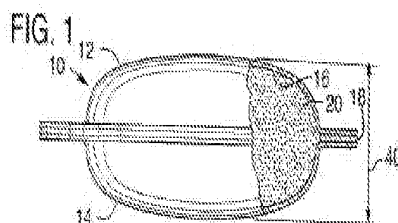
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and 2a. It will be understood that the machine interpretable feature may be any machine readable feature associated with packet 10.

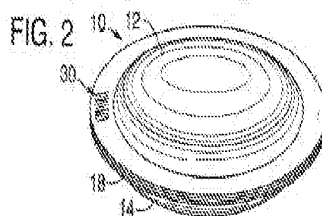
Boyd at [0034]:

Referring now to FIG. 4, a method of operation for the present invention is illustrated at 200. At 202, a brewing packet encoded with packet-characteristic data is placed into a brewing device. At 204, the packet-characteristic data is read by a sensor. At 206, the packet-characteristic data is interpreted by a processor. Finally, at 208, brewing is directed in accordance with the packet-characteristic data read by the sensor and interpreted by the processor.

Boyd at Fig. 1:



Boyd at Fig. 2:



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	<p>Boyd at Fig. 2a:</p> <p>FIG. 2a</p>  <p>Boyd at Claims 1-25.</p> <p>Jarisch at [0021]:</p> <p>In an embodiment, the container comprises a body and a lid connected to the body and wherein the code is present on the lid of the container. The lid may be a closed foil and/or a filter, for example.</p> <p>Jarisch at [0036]:</p> <p>In the following examples (see FIG. 4), the capsule comprises a cup-shaped body 69 extending by a flange-like rim 73. A lid such as a foil or membrane (liquid-tight or permeable to liquid) 60 is connected to the body, e.g., sealed on the rim. The capsule is filled with beverage ingredient such as ground coffee.</p> <p>See also Jarisch at FIG. 4:</p>
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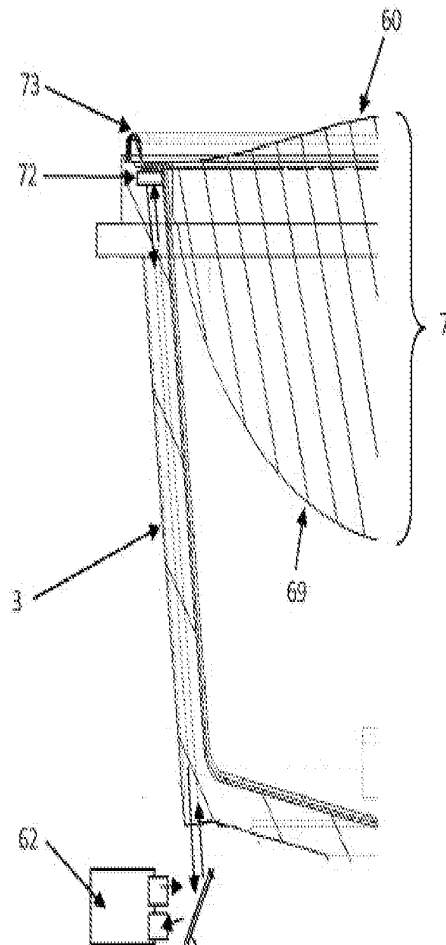


Fig. 4

See also Jarisch at FIGS 5-7.

Mahlich at Abstract:

A machine readable identification on a single-serving unit containing coffee powder for espresso machines, designed so that it can be read easily and accurately, is structured in a rotation-symmetrical manner and is applied to an essentially level surface of the single-serving unit, whereby the single-serving unit preferably consists of a single-serving capsule

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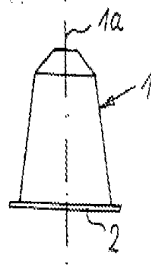
(1) having an essentially circular base (2) where-upon the identification is applied in a coaxial manner.

Mahlich at [0030]-[0032]:

FIGS. 1, 1a and 3 show a single-serving capsule 1 of an essentially frustoconical design arranged in a rotation-symmetrical manner around a symmetrical axis 1a.

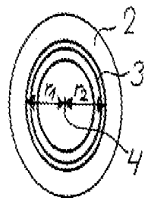
Mahlich at Fig 1:

Fig.1



Mahlich at Fig. 1a:

Fig.1a



Panesar at p. 9, ll. 8-18:

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	<p><u>Cartridge for use in the system</u></p> <p>As shown in Figure 10 to 21, the cartridge 1 generally comprises an outer member 2, an inner member 3 and a laminate 5. The outer member 2, inner member 3 and laminate 5 are assembled to form the cartridge 1 which has an interior 120 for containing one or more beverage ingredients, an inlet 121, an outlet 122 and a beverage flow path linking the inlet 121 to the outlet 122 and which passes through the interior 120. The inlet 121 and outlet 122 are initially sealed by the laminate 5 and are opened in use by piercing or cutting of the laminate 5.</p> <p>Panesar at p. 35, ll. 24–31:</p> <p>To insert the cartridge 1 the holder 251 is opened as described above to expose the cartridge mount 257. The cartridge 1 is then placed on the cartridge mount 257 received within the recess 290 such that the handle 24 of the cartridge is located in the irregularity 291. The optical or magnetic barcode 320 or RFID of the cartridge 1 is oriented directly above the aperture 326 in the cartridge mount 257.</p> <p>Panesar at p. 38, ll. 15–21:</p> <p><u>Insert for use in the system</u></p> <p>As described above, the machine 201 of the present invention may also be used with other inserts not necessarily of a cartridge form. An example of another suitable form of insert will now be described. The insert 400 comprises an upper part 401 and a lower part 402.</p> <p>Panesar at p. 14 at line 21 – p. 15 at line 2:</p> <p>The laminate 5 is formed from two layers, a first layer of aluminium and a second layer of cast polypropylene. The aluminium layer is between 0.02 and 0.07 mm in thickness. . . . In one embodiment the aluminium layer is 0.06 mm and the polypropylene layer is 0.025 mm thick. This laminate is particularly advantageous as it has a high resistance to curling during assembly. As a result the laminate 5 may be pre-cut to the correct size and shape and subsequently transferred to the assembly station on the production line without undergoing distortion. Consequently, the laminate is particularly well suited to welding. Other laminate</p>
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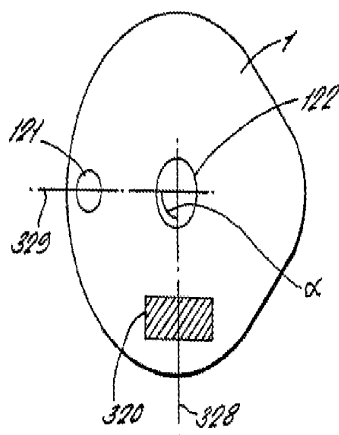
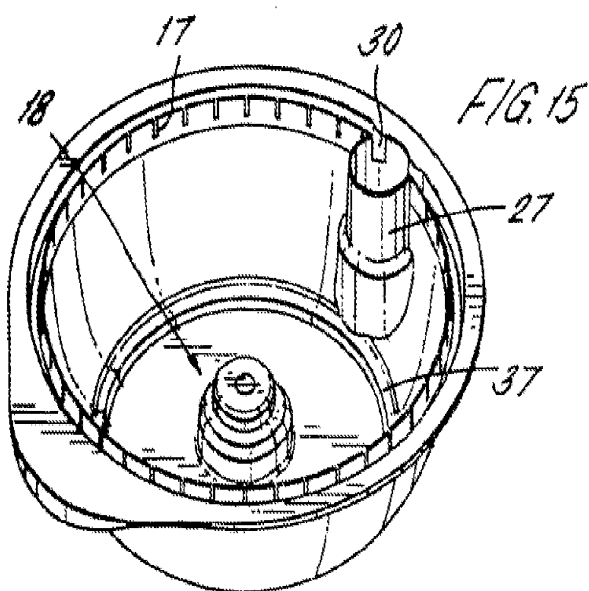
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	<p>materials may be used including PET/Aluminium/PP, PE/EVOH/PP, PET/metallised/PP and Aluminium/PP laminates.</p> <p>Panesar at p. 16, ll. 28-31:</p> <p>The laminate 5 is then affixed to the outer member 2 by forming a weld 126 around the periphery of the laminate 5 to join the laminate 5 to the lower surface of the outwardly extending flange 35.</p> <p>Panesar at p. 5, ll. 23-32:</p> <p>The insert of the present invention may contain or be loaded with one or more beverage ingredients suitable for 25 the formation of a beverage product. The beverage product may be, for example, one of coffee, tea, chocolate or a dairy-based beverage including milk. The beverage ingredients may be powdered, ground, leaf-based or liquid. The beverage ingredients may be insoluble or soluble. 30 Examples include roast and ground coffee, leaf tea, powdered chocolate and soup, liquid milk-based beverages, carbonated drinks and concentrated fruit juices.</p> <p>Panesar at p. 9, ll. 24-29:</p> <p>The cartridge 1 is particularly designed for use in dispensing filtered products such as roast and ground coffee or leaf tea. However, the cartridge 1 may be used with other products such as chocolate, coffee, tea, sweeteners, cordials, flavourings, alcoholic beverages, flavoured milk, fruit juices, squashes, sauces and desserts.</p>
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Panesar at FIGs. 10, 15, 21:

FIG. 10



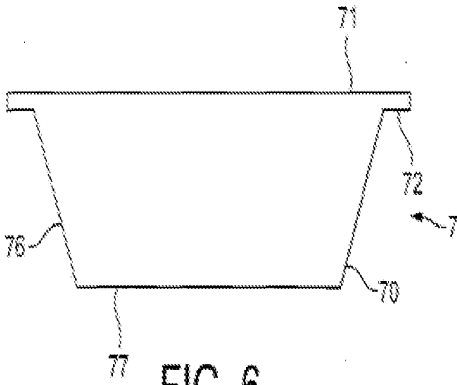
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	<p style="text-align: center;"><i>FIG. 21.</i></p> <p>Sweeney at 1:19-25:</p> <p>This beverage filter cartridge is comprised basically of an impermeable yieldably-piercable cup-shaped outer container internally subdivided by a permeable cone-shaped filter into first and second chambers. A granular or powdered dry beverage medium, e.g., roasted ground coffee, is stored in the first chamber, and the container is closed by an impermeable yieldably piercable lid.</p> <p>Sweeney at 4:20-23:</p> <p>The lid may be cut or blanked from any suitable impermeable heat sealable and yieldably piercable material, such as for example, a metallic/polymer laminate supplied by Winkpak Heat Seal Packaging, Inc. of Montreal, Canada.</p> <p>Yoakim at [0125]:</p> <p>The food substance in the capsule can be ground coffee powder, soluble coffee, tea, chocolate, whitener, flavours, and combinations thereof.</p>
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	<p>Yoakim at [0128]:</p> <p>The capsule can comprise a sealing lid. The sealing lid can comprise a flexible membrane. The membrane can comprise gas barrier and support layers made of polymers, aluminium, and/or aluminium alloys.</p> <p>Yoakim at [0129]:</p> <p>The capsule can also comprise a cup-shaped body onto which the sealing lid is sealed. The cup-shaped body may also comprise gas barrier materials, such as metal, e.g., thin aluminium and/or plastic.</p> <p>Yoakim at [0180]:</p> <p>The system 1 of the invention is illustrated in FIG. 1 in the more general sense. The system comprises a device 2 and a capsule 3. The device has a brewing module 4 into which the capsule can be inserted for being brewed and is removed after use for being discarded (e.g., for waste or recycling</p> <p>Yoakim at [0197]:</p> <p>FIGS. 6 and 7 illustrate a capsule that can suit the device according to the different embodiments of FIGS. 2 to 5. In FIG. 6, the capsule 7 comprises a cup-shaped body 70 with upwardly oriented sidewall 76 and a bottom wall 77. The sidewall forms a portion of cone which promotes the collection of the brewed liquid internally. The body terminates by an upper edge 72 raising outwards onto which is sealed a lid 71. The lid may be a flexible pierceable membrane of several microns in aluminium and/or plastic. The lid can be welded on the upper edges 72 of the body. It can be pointed out that the membrane and body preferably comprise gas barrier layers such as aluminium and/or EVOH.</p> <p>Yoakim at [0198]:</p>
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	<p>The capsule contains a substance chosen among the list consisting of ground coffee, soluble coffee, tea, a whitener such as dairy or non-dairy ingredient(s), herbal tea, nutritional substance, culinary ingredients and a mixture thereof.</p> <p>Yoakim at [0219]:</p> <p>The invention also relates to a food liquid preparation device for preparing a food liquid from a food substance contained in a single-use capsule, removably insertable in the device</p> <p>See, e.g., FIGS. 6-7:</p>  <p>FIG. 6</p>
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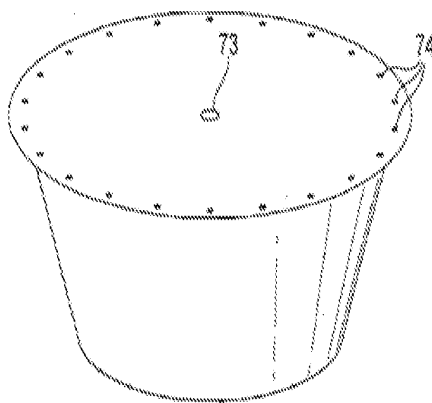


FIG. 7

Yoakim at [0414]:

As shown in FIGS. 26 and 27, a preferred capsule 101 of the invention generally comprises a dished body 102 onto which is sealed a sealing foil 103. The sealing foil 103 is sealed onto a peripheral rim 104 of the body at a sealing annular portion 105. The rim 104 can extend outwards forming a small annular portion, e.g., of about 2-5mm. The dished body comprises a bottom wall 106 and a side wall 107 which preferably widens in direction of the large open end of the body opposed to the bottom wall. The dished body is preferably rigid or semi-rigid. It can be formed of a food grade plastics, e.g., polypropylene, with a gas barrier layer such as EVOH and the like or aluminium alloy or a complex of plastic and aluminium alloy. The sealing foil 103 can be made of a thinner material such as a plastic laminate also including a barrier layer or aluminium alloy or a combination of plastic and aluminium alloy. The sealing foil is usually of a thickness between 30 and 250 microns, for example. The sealing foil membrane can be pierced for creating the water inlet and the beverage outlet(s) as will be described later in the description.

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See, e.g., FIGS. 26 and 27:

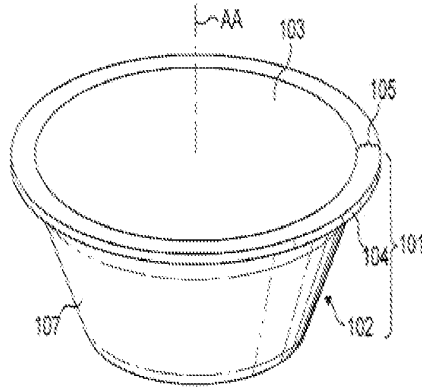


FIG. 26

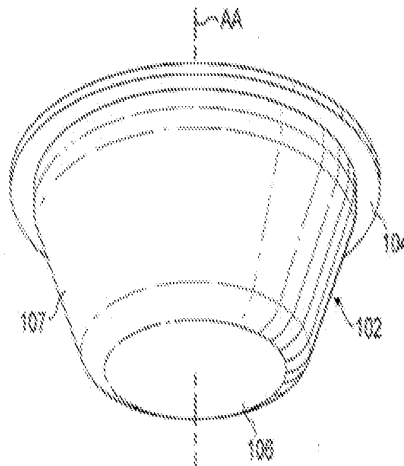
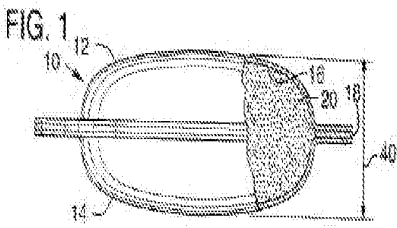


FIG. 27

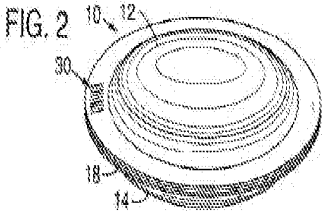
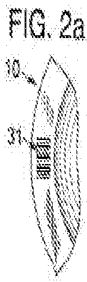
Yoakim at [0461]:

FIGS. 45 to 50 are other variants of capsules according to the invention. For example, the capsule of FIG. 45 has a cylindrical side wall 700, an upper wall 701 and a lower wall 702

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	<p>both sealed or connected to the sidewall 700. The capsule is gastight by choosing materials for the walls, e.g., aluminium and/or suitable plastics, which have gas barrier properties. The upper walls and lower walls can be flexible or rigid depending on said materials. For example, wall 701 can be a flexible sealing membrane welded on upper rim 703 of the body 705 forming the sidewall 700 and lower wall 702. The side wall 700 may comprise outlets 704, 706 for release of the liquid when centrifuged in the beverage preparation device around central axis AA of the capsule. Optionally, the capsule may comprise a filter part 708 delimiting the cavity 709 for the substance and a collecting recess 710 peripherally placed relative to the central cavity.</p>
<p>[1.d] the base element comprising a flange, the flange having a top side to which the foil lid is sealed.</p>	<p>The below cited art discloses, either expressly or inherently, the base element comprising a flange, the flange having a top side to which the foil lid is sealed. <i>See, e.g.:</i></p> <p>Boyd at [0027]:</p> <p>As indicated above, opposing filter portions 12 and 14 are secured together about their respective perimeters to form cavity 16. In the depicted embodiment, the filter portions are secured to an orbicular gasket 18. The gasket is deformable to allow for an optimum seal. In an alternative embodiment, the packet may be integrally formed from a continuous filter in which no gasket is required. Although the depicted packet is circular, it will be appreciated that the cavity may take virtually any shape capable of containing coffee grounds. The size and bed depth 40 of the packet is determined by the quantity of coffee grounds, the density of coffee grounds, and the desired coffee beverage taste.</p> <p>Boyd at Fig. 1:</p> 

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	<p>Boyd at Fig. 2:</p>  <p>Boyd at Fig. 2a:</p>  <p>Boyd at Claim 3.</p> <p>Jarisch at [0036]:</p> <p>In the following examples (see FIG. 4), the capsule comprises a cup-shaped body 69 extending by a flange-like rim 73. A lid such as a foil or membrane (liquid-tight or permeable to liquid) 60 is connected to the body, e.g., sealed on the rim. The capsule is filled with beverage ingredient such as ground coffee.</p> <p><i>See also Jarisch at FIG. 4:</i></p>
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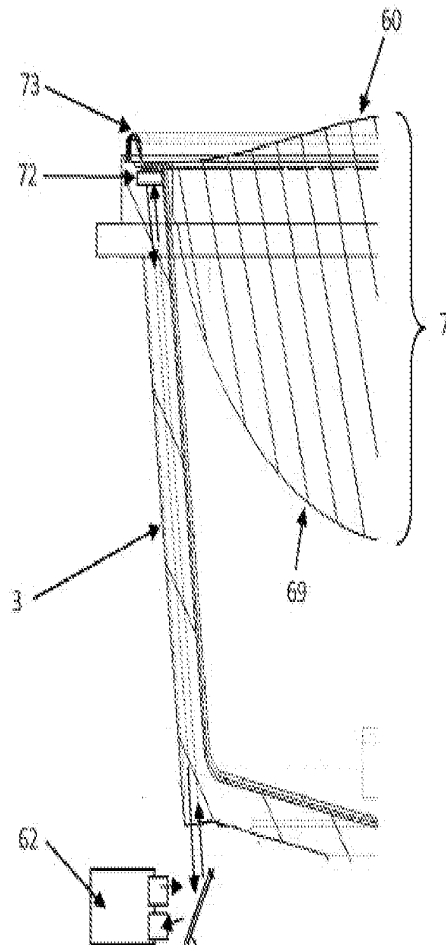


Fig. 4

See also Jarisch at FIGS 5-7.

Panesar at p. 12, ll. 1-7:

A lower end of the outwardly extending shoulder 33 is provided with an outwardly extending flange 35 which extends perpendicularly to the major axis X. Typically the flange 35 has a width of between 2 and 4 mm. A portion of the flange 35 is enlarged to form a handle 24 by

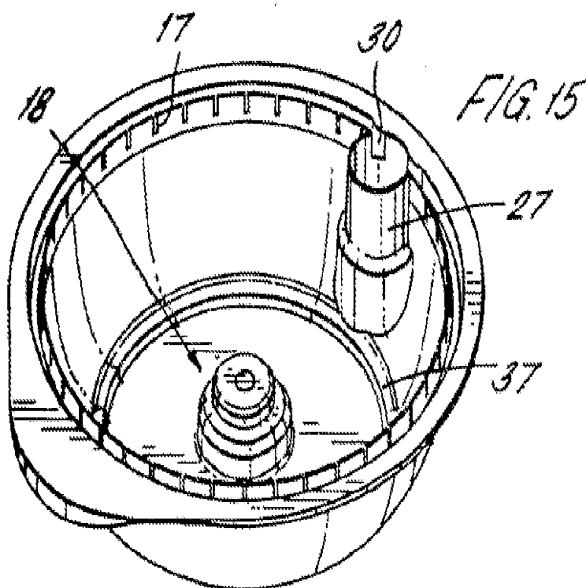
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which the outer member 2 may be held. The handle 24 is provided with an upturned rim 25 to improve grip.

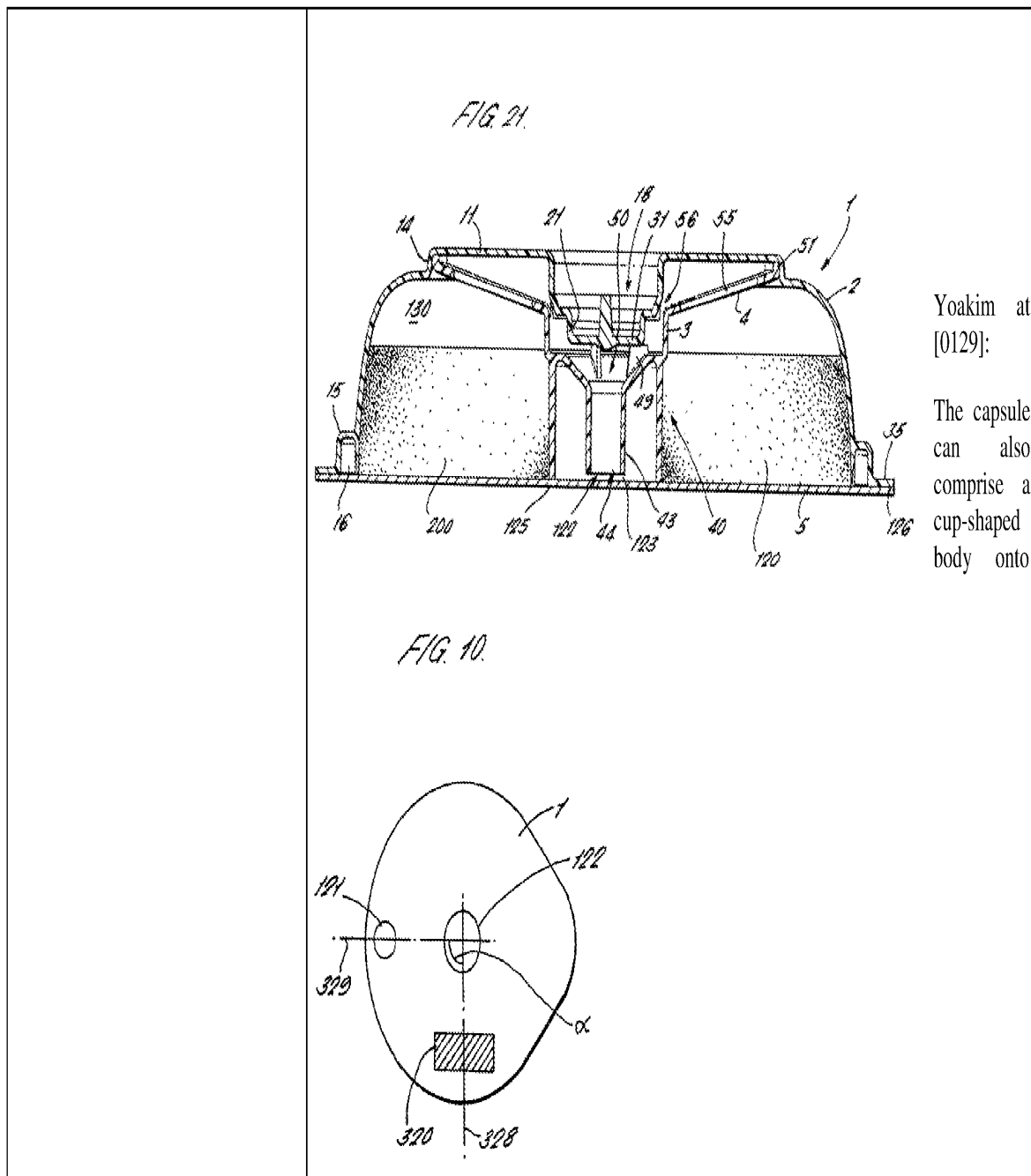
Panesar at p. 16, ll. 28–32:

The laminate 5 is then affixed to the outer member 2 by forming a weld 126 around the periphery of the laminate 5 to join the laminate 5 to the lower surface of the outwardly extending flange 35.

Panesar at FIGs. 10, 15, 21:



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	<p>which the sealing lid is sealed. The cup-shaped body may also comprise gas barrier materials, such as metal, e.g., thin aluminium and/or plastic.</p> <p>Yoakim at [0197]:</p> <p>FIGS. 6 and 7 illustrate a capsule that can suit the device according to the different embodiments of FIGS. 2 to 5. In FIG. 6, the capsule 7 comprises a cup-shaped body 70 with upwardly oriented sidewall 76 and a bottom wall 77. The sidewall forms a portion of cone which promotes the collection of the brewed liquid internally. The body terminates by an upper edge 72 raising outwards onto which is sealed a lid 71. The lid may be a flexible pierceable membrane of several microns in aluminium and/or plastic. The lid can be welded on the upper edges 72 of the body. It can be pointed out that the membrane and body preferably comprise gas barrier layers such as aluminium and/or EVOH.</p> <p><i>See, e.g., FIGS. 6-7:</i></p>
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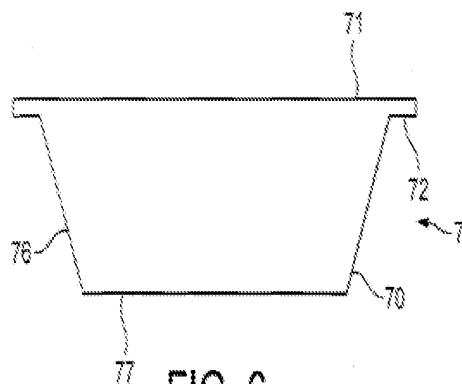


FIG. 6

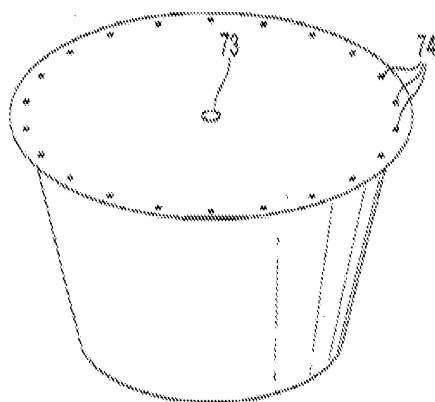


FIG. 7

Yoakim at [0414]:

As shown in FIGS. 26 and 27, a preferred capsule 101 of the invention generally comprises a dished body 102 onto which is sealed a sealing foil 103. The sealing foil 103 is sealed onto a peripheral rim 104 of the body at a sealing annular portion 105. The rim 104 can extend outwards forming a small annular portion, e.g., of about 2-5mm. The dished body comprises a bottom wall 106 and a side wall 107 which preferably widens in direction of the large open end

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of the body opposed to the bottom wall. The dished body is preferably rigid or semi-rigid. It can be formed of a food grade plastics, e.g., polypropylene, with a gas barrier layer such as EVOH and the like or aluminium alloy or a complex of plastic and aluminium alloy. The sealing foil 103 can be made of a thinner material such as a plastic laminate also including a barrier layer or aluminium alloy or a combination of plastic and aluminium alloy. The sealing foil is usually of a thickness between 30 and 250 microns, for example. The sealing foil membrane can be pierced for creating the water inlet and the beverage outlet(s) as will be described later in the description.

See, e.g., FIGS. 26 and 27:

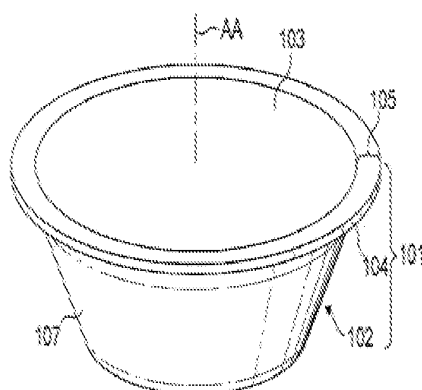
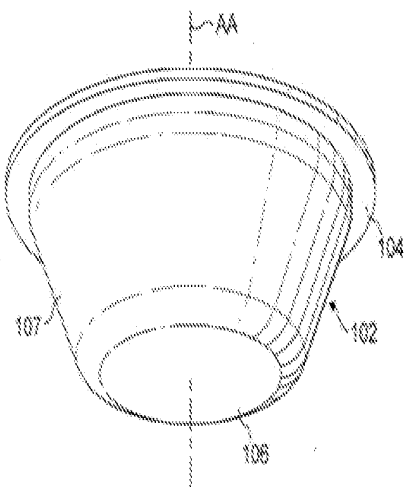


FIG. 26

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	 <p>FIG. 27</p>
<p>[1.e] and an opposing bottom side with a barcode located on the bottom side,</p>	<p>The below cited art discloses, either expressly or inherently, an opposing bottom side with a barcode located on the bottom side. <i>See, e.g.:</i></p> <p>Aker at Abstract:</p> <p>A method of associating a barcode with a product that has a product body with a round ending section. The method includes positioning the barcode repetitively along a circle sharing a common center with an outer-ring of the round ending section. A method of reading such a barcode on such a product includes positioning at least a portion of the round ending section of the product within a field of view of a barcode reader such that a complete barcode can be construed from a portion of a first instance of the barcode and a portion of the second distance of the barcode.</p> <p>Aker at [0003]:</p> <p>Generally, if a product is somewhat cylindrically symmetric and has some of its information coded with barcodes, when such product is to be handled by certain handling-machine, it may</p>

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	<p>be desirable for a barcode reader in the handling-machine to find the barcode on such product repeatedly and reliably.</p> <p>Aker at [0004]:</p> <p>In one aspect, the invention is directed to a product. The product includes a product body with a round ending section, and a barcode repetitively positioned along a circle sharing a common center with an outer-ring of the round ending section.</p> <p>Aker at [0006]:</p> <p>In another aspect, the invention is directed to a method of associating a barcode with a product that has a product body with a round ending section. The method includes positioning the barcode repetitively along a circle sharing a common center with an outer-ring of the round ending section of the product body.</p> <p>Aker at [0017]:</p> <p>FIG. 2A-FIG. 2B illustrate a product with a product body 40 that is somewhat cylindrically symmetric and some information of the product is coded with barcodes in accordance with some embodiments. In FIG. 2A, the product body 40 is generally in the shape of a conic cylinder. The product body 40 is terminated with a round ending section 45. FIG. 2B is a top view of the product body 40. In FIG. 2B, a barcode is repetitively positioned along an outer-ring 46 of the round ending section 45. Multiple instances of the same barcode, 50A-50H, are printed on the surface of the round ending section 45. In other implementations, the barcode can be repetitively positioned along a circle sharing a common center with an outer-ring of the round ending section, and the diameter of such circle can be smaller than the diameter of the outer-ring. In general, the product body 40 can be in the shape of a conic cylinder as shown in FIG. 3A, in the shape of a cylinder as shown in FIG. 3B, or in any other shape that is somewhat cylindrically symmetric as shown in FIG. 3C.</p> <p>Aker at Fig. 1B:</p>
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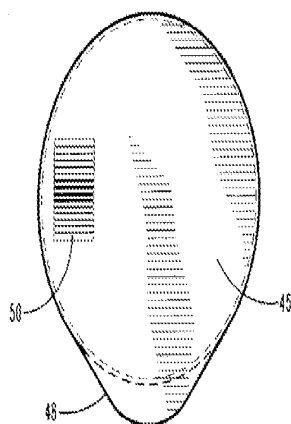


FIG. 1B

See also Aker at [0018]-[0022]; *id.* at Figs. 1A, 2A, 2B, 4A, 4B, 4C, 5A, 5B.

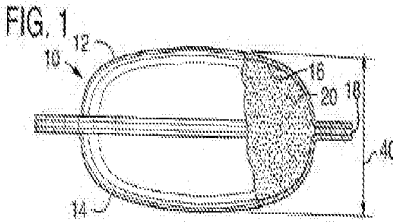
Boyd at [0023]:

With the foregoing in mind, it will be appreciated that it would be desirable to automatically customize the brew operation based on particular characteristics of the packet, the characteristics of the coffee, and/or the tastes of the user, whether or not the user is aware of what changes in the brew operation will lead to the desired taste. The present invention provides a vehicle for such customization in the form of an encoded packet configured to provide the brewing machine with data useful in directing the brewing operation in accordance with packet or packet content characteristics and/or the user's tastes.

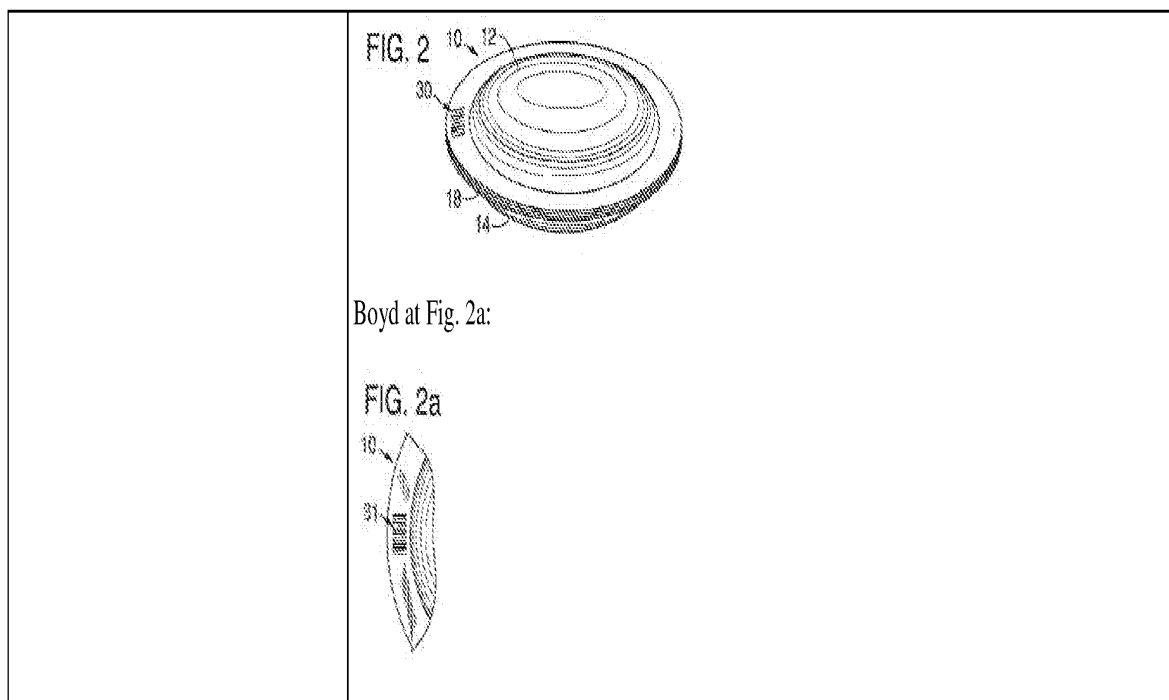
Boyd at [0028]:

As shown in FIG. 2, packet 10 includes a machine interpretable feature 30 which directs operation of the coffee machine in accordance with predefined brewing directives. In the first depicted embodiment, the machine interpretable feature is a barcode 31 as depicted in FIG. 2 and 2a. It will be understood that the machine interpretable feature may be any machine readable feature associated with packet 10.

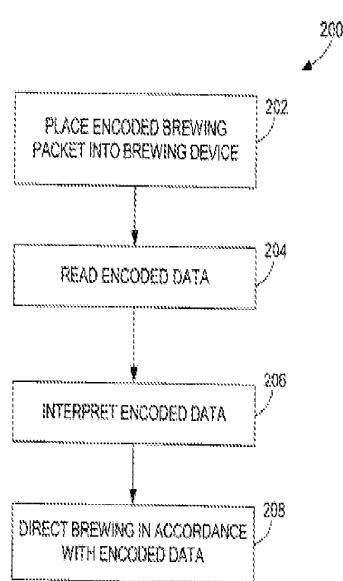
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	<p>Boyd at [0034]:</p> <p>Referring now to FIG. 4, a method of operation for the present invention is illustrated at 200. At 202, a brewing packet encoded with packet-characteristic data is placed into a brewing device. At 204, the packet-characteristic data is read by a sensor. At 206, the packet-characteristic data is interpreted by a processor. Finally, at 208, brewing is directed in accordance with the packet-characteristic data read by the sensor and interpreted by the processor.</p> <p>Boyd at [0037]:</p> <p>The encoded packets also may be used to track brewing information which may be useful in ensuring satisfaction with the brewed coffee beverage. For example, the packet may include an encoded date for use in tracking freshness of the coffee grounds contained within the packet. Upon determining that the packet is stale, the processor may direct the machine to note such staleness, thus avoiding an unsatisfactory beverage. Similarly, the packet may contain encoded data related to the coffee blend contained within the packet, such data being stored in memory to provide a history of coffee blends. The encoded packet also may contain encoded data defining the source of the packet so as to prohibit use of counterfeit packets, or packets from unauthorized suppliers.</p> <p>Boyd at Fig. 1:</p>  <p>Boyd at Fig. 2:</p>
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	<p>Boyd at Fig. 4:</p>  <pre> graph TD 200 --> 202[PLACE ENCODED BREWING PACKET INTO BREWING DEVICE] 202 --> 204[READ ENCODED DATA] 204 --> 206[INTERPRET ENCODED DATA] 206 --> 208[DIRECT BREWING IN ACCORDANCE WITH ENCODED DATA] </pre> <p>FIG. 4</p> <p>Boyd at Claims 1-25.</p> <p>Jarisch at [0016]-[0017]:</p> <p>More particularly, the capsule has a circumference wherein the code is arranged on the container along an arc-shaped or circular path of the circumference. In a particular mode, the capsule has a circumference wherein the code comprises successive segments which are individually rectilinear but extend substantially along at least a part of the circumference. More particularly, the code is arranged along at least a eighth of the circumference. This configuration provides a reliable reading or retrieval of information as well as an effective portion for information. In order to ensure a reliable reading or retrieval of information, the code is repeated along said circumference. The repetition ensures a higher probability that at least one code is readable but also may potentially reduce the reading time.</p>
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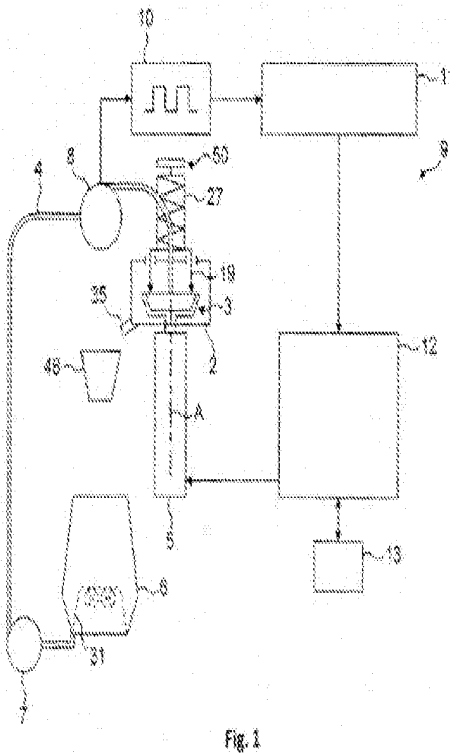
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	<p>Preferably, the code is an optical code. The code may be a bit code formed by a series of discrete polygonal (e.g., rectangles or squares) or dot surfaces printed on the container and/or embossed in the container.</p> <p>Jarisch at [0019]:</p> <p>Preferably, the code is printed or embossed to form a pattern which possesses surfaces having different reflective and/or absorbing properties to light. In particular, the pattern possesses first surfaces and second surfaces having different reflective and/or absorbing properties to light. More particularly, the pattern possesses first surfaces inclined mirroring or absorbing properties to light and second surfaces having flat mirroring or flat reflective properties to light.</p> <p>Jarisch at [0022]:</p> <p>In another embodiment, the code is present on the rim of the capsule. In the most preferred embodiment, the code is present on the bottom of the rim of the capsule which is opposed to the lid of the capsule. The bottom of the rim is sufficiently away from the liquid injection and beverage delivery areas so that there is a lower risk for the code to become unreadable such if partly or totally hidden or soiled by beverage residues or otherwise (e.g., coffee particles). As a result, the reading is made more reliable. The reading may also be carried out while the capsule is in place in the beverage production device. Therefore, the preparation of the beverage is simplified and the preparation time can be reduced.</p> <p>Jarisch at [0024]:</p> <p>In particular the reading means may comprise a light emitter and a light sensor. In an alternative, the reading means comprises an inductive sensor. The optical reading means or inductive sensor may be arranged to detect a code on the rim of the capsule.</p> <p>Jarisch at [0063]-[0064]:</p> <p><u>2) Optical reading on rim bottom side of capsule (figures 4 to 7):</u></p>
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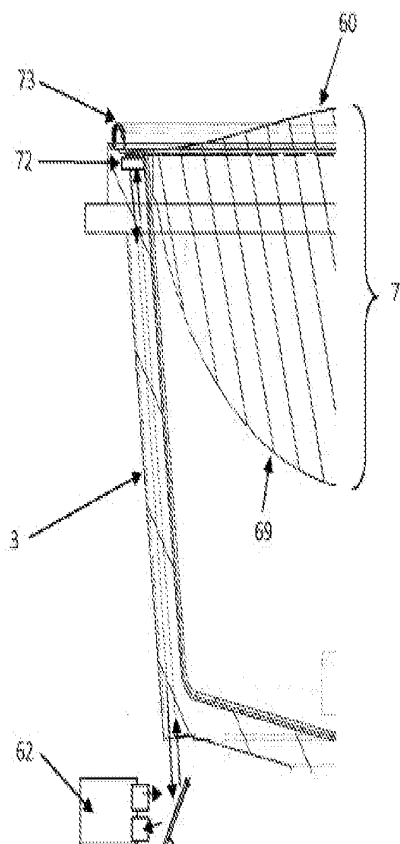
The capsule 7 may comprise a code 70 on the bottom side 72 of its rim 73. The bit code is formed of a succession of small rectangular surfaces having light mirroring properties and intermediate surfaces having flat mirroring and/or diffusing properties.

See Jarisch at FIG. 1:



Jarisch at FIG. 4:

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Jarisch at [0022]:

In the most preferred embodiment, the code is present on the bottom of the rim of the capsule which is opposed to the lid of the capsule. The bottom of the rim is sufficiently away from the liquid injection and beverage delivery areas so that there is a lower risk for the code to become unreadable such if partly or totally hidden or soiled by beverage residues or otherwise (e.g., coffee particles). As a result, the reading is made more reliable. The reading may also be carried out while the capsule is in place in the beverage production device. Therefore, the preparation of the beverage is simplified and the preparation time can be reduced.

Jarisch at [0042]-[0048]:

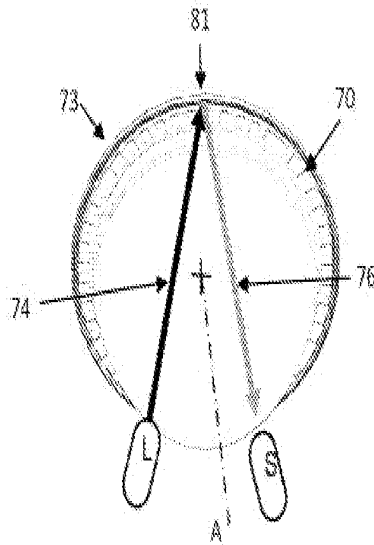
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	<p>Onto the capsule foil 60, a plurality of bits forming the code 61 is applied along a circular or arc-shaped path.</p> <p>Preferably, the code is placed on a flat portion of the lid and close to the peripheral edge of the capsule. The code is preferably placed the lid that is supported by the flange-like rim of the capsule or overlaps with the rim. Hence, the code is not distorted due to mechanical constraints and can be read more reliably.</p> <p>The marks may consist of:</p> <p>Mirroring or absorbing surfaces for providing bit 0 and,</p> <p>Diffusing and reflective surfaces for providing bit 1</p> <p>The binary values 0 and 1 are arbitrary chosen and can be inverted.</p> <p>The code is read by rotating the capsule along a central axis A (FIG. 1).</p> <p>Jarisch at [0070]:</p> <p>The bit code is read by rotating the capsule along its central axis A.</p> <p>Jarisch at [0086]:</p> <p>Therefore, the number of bits and their bit code depend on the number and specific arrangement of mirror surfaces (e.g. rectangles) and diffusing or absorbing surfaces (e.g., zones between the rectangles). The same sequence of bits forming a code can be repeated several times on the circumference of the rim. This repetition provides redundancy and more reliability to the reading.</p> <p>Jarisch at [0099]:</p> <p>The code preferably comprises three sections, the synchronization section, the payload section and the verification section. The synchronization section serves for the synchronization purpose i.e. to inform the sensor when the code begins. Since the speed of the rotation of the capsule can vary, the synchronization is achieved through a known sequence of bits such as 0.1.0.1. Then the payload of the code identifying the capsule can be read. In order to avoid</p>
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misinterpretation of the code, the payload can be followed by verification bits. These bits can be a checksum on the payload or a similar verification function.

Jarisch at FIG. 5:



See also Jarisch at Claims 11-14; FIGs. 6-7.

Mahlich at Abstract:

A machine readable identification on a single-serving unit containing coffee powder for espresso machines, designed so that it can be read easily and accurately, is structured in a rotation-symmetrical manner and is applied to an essentially level surface of the single-serving unit, whereby the single-serving unit preferably consists of a single-serving capsule (1) having an essentially circular base (2) where-upon the identification is applied in a coaxial manner.

Mahlich at [0001]-[0002]:

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	<p>The invention concerns machine readable identification on a single-serving unit containing coffee powder for espresso machines.</p> <p>Another aspect of the invention concerns a system particularly suitable for the registration of machine readable identification.</p> <p>Mahlich at [0005]:</p> <p>The single-serving capsules consist mostly of a deep-drawn plastic or aluminium foil and their advantage, when compared to pouches, lies in the fact that they have an air-tight seal and that certain manufacturers fill them with a protective gas containing the coffee aroma as well. Such pre-proportioned single-serving units are available for approximately 10 different coffee fillings. Due to this variety the consumer is able to stock smaller amounts of different types of coffee. In addition, the use of these single-serving units in conjunction with the special brewing heads of those espresso machines equipped to process such single-serving units results in a reliably constant optimum brew.</p> <p>Mahlich at [0006]:</p> <p>Such espresso machines, already known from EP 1 046 366 A1, for example, are provided with a storage magazine storing assorted single-serving units having different contents that are conveyed from the storage magazine into the brewing head during the course of an automatic brewing process. The storage magazine consists of car-touches, also termed magazine tubes, arranged on a turntable, wherein the individual single-serving units are stacked. In order to keep the different types of coffee separate and to select different coffee types, each magazine tube is stocked with only one type of coffee. At the start of the brewing process the selected magazine tube is rotated with the turntable into the dispensing position so that the desired type of coffee can be obtained. For this purpose the single-serving unit at the bottom of the stack inside the magazine tube is conveyed to a brewing chamber of the brewing head. Preferably each magazine tube is provided with a window so that the consumer is able to recognize the desired type of coffee, for example by means of a certain colour that is assigned to a certain type of coffee. It is also possible to equip the single-serving units with a certain identification code able to be registered by a reading device, so that the contents of the single-serving units can be recognized electronically. However, this method has thus far not</p>
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	<p>been used for presently-known espresso machines. This may be due to the fact that the usual bar code structured in a linear manner to be read by a simple linear reading device must either be positioned correctly with regard to the position of the reading device, which is somewhat difficult in view of the inherent rotation-symmetric design of single-serving capsules and pouches due the technology of their manufacture, or that an expensive and voluminous double mirror scanner is required as the reading device.</p> <p>Mahlich at [0012]-[0014]:</p> <p>In particular, according to claim 3 such rotation-symmetrical identification may be an ID code consisting of concentric circles, whereby the usual linear reading heads can be used. If the ID code is a multi-digit binary code, just four concentric circles are sufficient to reliably identify a great variety of coffee types.</p> <p>If the single-serving unit consists of a capsule with a mainly circular base, according to claim 4, the identification as defined above is applied to the base in a coaxial manner. If the single-serving unit consists of an essentially lozenge-shaped pouch with an upper and a lower surface, the identification is applied to each surface in a coaxial manner. Therefore it does not matter, with regard to the machine reading of the identification, whether the upper or the lower surface of a pouch is facing downwards when the pouches are inserted into the storage magazine.</p> <p>Apart from coffee type identification, the identification on any single-serving unit may also contain producer identification, whereby the latter in conjunction with an adapted evaluation system for controlling the espresso machine can block operation of the espresso machine if the producer identification on the single-serving unit does not correspond to the machine's preprogrammed producer identification.</p> <p>Mahlich at [0030]-[0032]:</p> <p>FIGS. 1, 1a and 3 show a single-serving capsule 1 of an essentially frustoconical design arranged in a rotation-symmetrical manner around a symmetrical axis 1a.</p>
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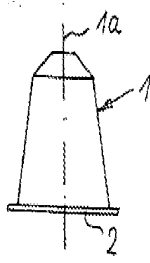
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An ID code 3 consisting of concentric circles is shown on the base 2 of the single-serving capsule 1, whereby the symmetrical axis 1a of the single-serving capsule passes through the centre point 4 of the circles.

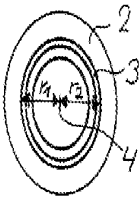
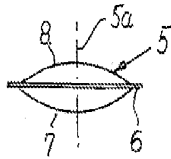
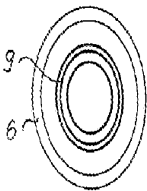
FIGS. 2 and 2a show a pouch 5 containing one serving of pre-pressed coffee powder whereby the pouch, with the exception of its edge 6, is essentially lozenge-shaped. The pouch 5 with its edge 6 are arranged in a rotation-symmetrical manner around a symmetrical axis 5a. The lower surface 7 as well as the upper surface 8 of pouch 5 is provided with an ID code 9 consisting of concentric circles and extending in a rotation-symmetrical manner around the symmetrical axis 5a.

Mahlich at Fig 1:

Fig.1



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	<p>Mahlich at Fig. 1a:</p> <p>Fig.1a</p>  <p>Mahlich at Fig. 2:</p> <p>Fig.2</p>  <p>Mahlich at Fig. 2a:</p> <p>Fig.2a</p> 
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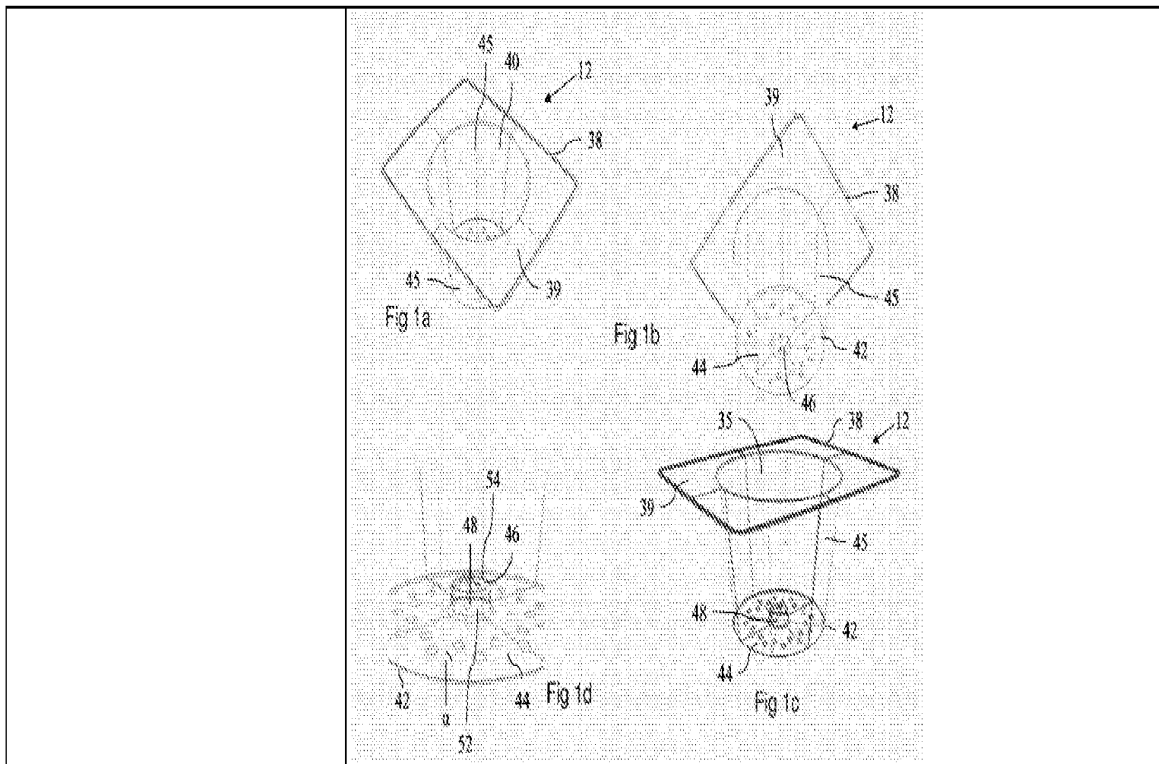
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	<p>Panesar at p. 2, ll. 19–28:</p> <p>[T]he lower surface of the insert further comprises a barcode or RFID which, in use, is readable by a barcode or RFID reader of the beverage preparation machine for controlling operation of the beverage preparation machine, wherein the barcode or RFID is located on the lower surface of the insert such that a line joining the outlet of the insert to a centre of the barcode and a line joining the outlet of the insert to the inlet of the insert [are] separated by a minimum angular separation of greater than 70 degrees.</p> <p>Panesar at p. 2 at line 29 – p. 3 at line 12:</p> <p>Advantageously, it has been found that this minimum angular separation of the barcode or RFID from the inlet improves the accuracy of the reading of the barcode or RFID by the recognition means of the machine. Firstly, the separation results in any distortion of the inlet area having a minimal affect [sic] on the region of the barcode or RFID. Secondly, it has been found that there may be a small degree of leakage of fluid from the inlet area during dispensation since dispensation occurs at pressure. This fluid may spread, in particular due to capillary effect between the insert and a brew to partial obfuscation of the resulting in a greater chance head of the machine, leading barcode or RFID by the fluid of the barcode or RFID being misread. With the barcode or RFID separated by an angle of greater than 70 degrees it has been found that this problem does not occur.</p> <p>Panesar at p. 3, ll. 18–20:</p> <p>The barcode or RFID is preferably located at or near a periphery of the lower surface.</p> <p>Panesar at p. 18, ll. 24–31:</p> <p>[T]he cartridge 1 is provided on the laminate with a barcode 320 as shown in Figure 10. The barcode 320 is formed from a plurality of bars of contrasting colour. Preferably the bar are black on a white background to maximise the contrast. The barcode 320 is not required to conform to a published standard but a standard format for barcodes, such as EAN-13, UPC-A, or Interleaf 2 of 5 may be used.</p>
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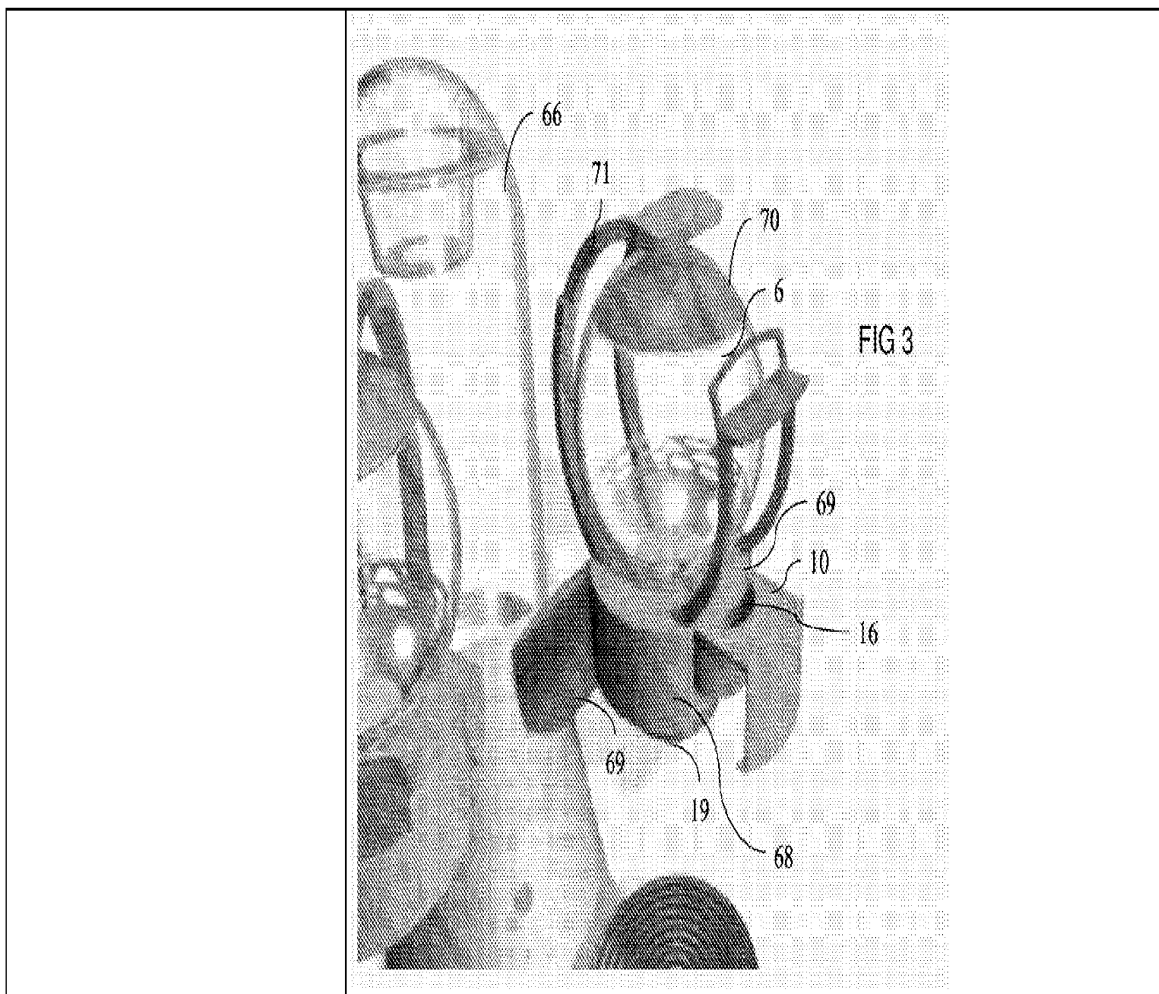
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	<p>Panesar at p. 20, ll. 10–13:</p> <p>Preferably, the barcode 320 is also located near a periphery of the laminate 5 so as to separate the barcode 320 from the outlet 122 so as to avoid distortion of the barcode 320 on piercing of the outlet 122.</p> <p>Panesar at p. 35, ll. 24–31:</p> <p>To insert the cartridge 1 the holder 251 is opened as described above to expose the cartridge mount 257. The cartridge 1 is then placed on the cartridge mount 257 received within the recess 290 such that the handle 24 of the cartridge is located in the irregularity 291. The optical or magnetic barcode 320 or RFID of the cartridge 1 is oriented directly above the aperture 326 in the cartridge mount 257.</p> <p>Van Belleghem at Figures 1a-d, 3, 8, 10A-C:</p>
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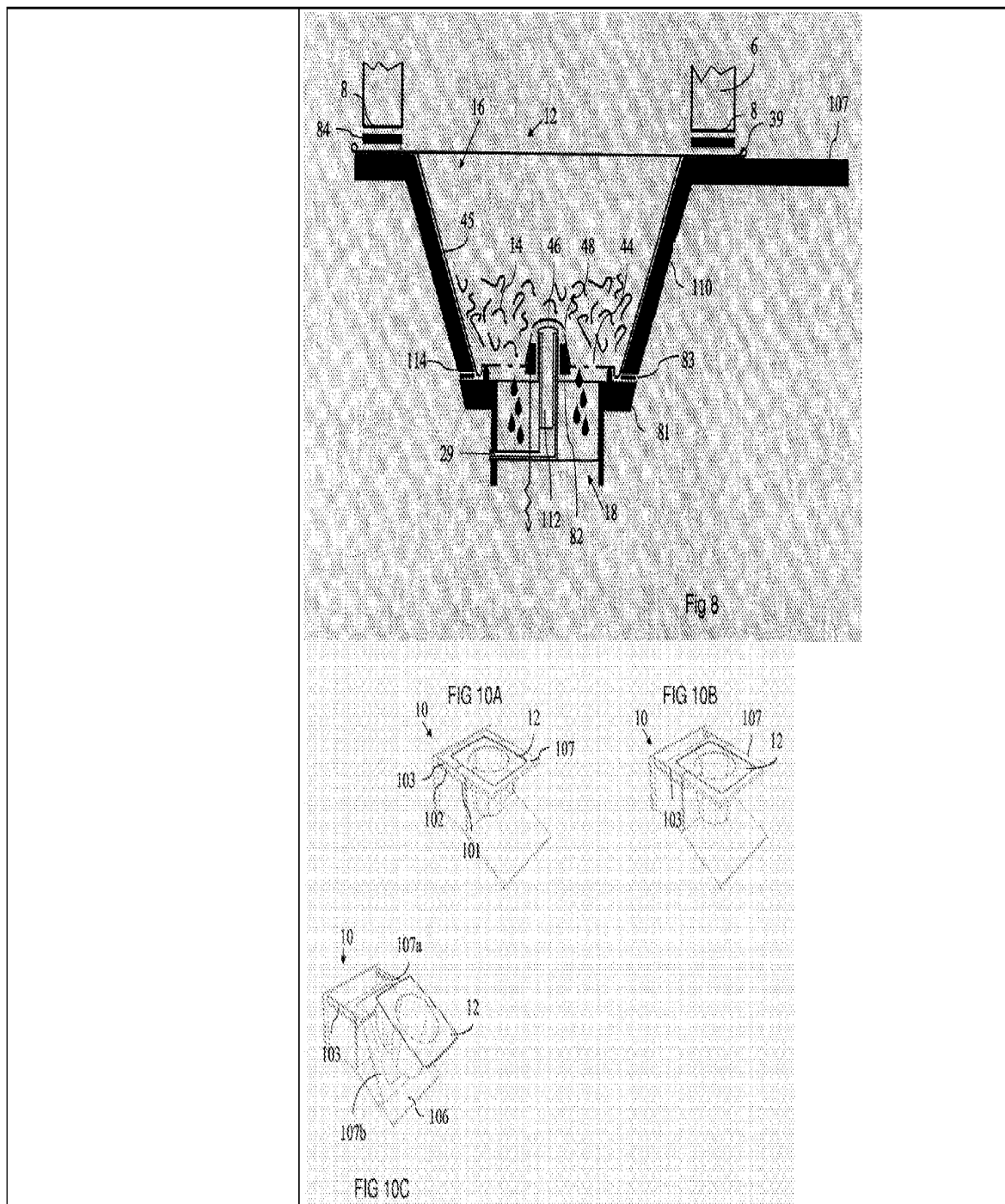
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	<p>Van Belleghem at [0032]:</p> <p>According to one embodiment, the cartridge includes automatic readable means adapted to be read or detect by a detecting or reading means. The readable means may comprise and/or inform on preparation parameters for indicating how to infuse the infusible substance of the cartridge at best.</p> <p>Van Belleghem at [0033]:</p> <p>Advantageously, the preparation parameters may consist of the infusion temperature and/or the infusion duration and/or when the gas injection takes place, how long it lasts, etc.</p> <p>Van Belleghem at [0046]:</p> <p>The cartridge 12 may comprise marks or any automatic readable means comprising or indicating infusion parameters. The marks or readable means may be located either on the outside surface of the side walls 45 or on the lip 39 or on the sheet 50.</p> <p>Van Belleghem at [0055]:</p> <p>Referring now to figure 3, the platform 68 comprises a receptacle 10 for receiving a cartridge 12 containing infusible substances 14. In this particular embodiment, the receptacle 10 consists of a drawer. The drawer 10 is operable between at least a first position and a second position. The drawer 10 slides from a closed position in the platform 68 to an opened position out of the platform 68. The drawer comprises a cavity 16 into which a cartridge 12 (not represented) containing infusible substances may be inserted. The drawer 10 may slide either automatically or manually. When the drawer 10 is closed in the platform 68, the cavity 16 of the drawer 10 communicates with the bottom opening 8 of the infusion container 6, so that the infusion container 6 and the cavity 16 form an infusion chamber.</p> <p>Van Belleghem at [0080]:</p>
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	<p>Once the drawer 10 is closed within the platform 68 and once the top sheet 50 of the cartridge 12 has been cut out, the tray 107 is raised up away from the side panels 104a, 104b. The lip 39 of the cartridge 12 located in the recess 109 of the tray 107 is brought into contact with the bottom opening 8 of the infusion container 6. A gasket 84 disposed on the edge of the bottom opening 8 ensures a hermetic connection between the infusion container 6 and the lip 39. The cartridge 12 is firmly maintained blocked within the cavity 16.</p> <p>Van Belleghem at [0081]:</p> <p>The dimensions of the opening 8 of the infusion container 6 are equal or larger than those of the section of the cavity 16 on the tray 107 to surround the opening 35 of the cartridge 12. The dimensions of the opening 8 of the infusion container 6 are smaller than those of the section of the recess 109 of the tray 107.</p> <p>Yoakim at [0477]:</p> <p>The capsule system further comprises an identification means associated to the different capsules in the set for identifying each capsule and adjusting brewing parameters accordingly.</p> <p>Yoakim at [0496]:</p> <p>The recognition means can be differentiable by a visual code such as a barcode, a colour, a sign, a logo, etc., or by a radio-frequency code (RFID), a magnetic element or by an identifiable shape.</p>
[1.f] the base element has a wall region with an electrically conductive section	<p>The below cited art discloses, either expressly or inherently, the base element has a wall region with an electrically conductive section. <i>See, e.g.:</i></p> <p>Boyd at [0019]-[0021]:</p> <p>Although the present invention may be used in virtually any brewing machine, it is described herein for use in the context of machines such as those disclosed in U.S. Pat. No. 5,974,949 to Weber et al. and U.S. Pat. No. 6,035,762 to Ruckstuhl. Those patents disclose machines for brewing espresso using espresso packets in the form of filter capsules which are</p>

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	<p>received through a funnel into a brewing chamber where water is passed through the filter capsule to produce an espresso beverage. The subject matter of each of these patents is incorporated herein by this reference.</p> <p>The invention also may be practiced in connection with espresso machines such as those disclosed in U.S. Pat. Nos. 4,253,385, 4,254,694, 4,353,293, 4,429,623, 4,484, 515, 4,555,894 and 4,852,333, all to Illy. These patents disclose various aspects of espresso machines which include brewing chambers configured to receive pre-fabricated espresso packets through which water is passed to produce an espresso drink. The subject matter of each of these patents also is incorporated herein by this reference.</p> <p>While the aforementioned machines generally are described for use in connection with espresso packets which contain a single serving of espresso, it will be appreciated that the present invention considers application of the relevant principles to machines which employ coffee packets for use in brewing multiple cups, which employ coffee packets of various size and shape, which employ various filter media and which contain coffee of various varieties, roasts, and grinds. Furthermore, the packet and methodology described herein may also produce other types of beverages such as tea, cider, and/or any beverage which is produced by mixing various ingredients. The packet and methodology is not limited to hot beverages and may be used to produce cold beverages.</p> <p>Boyd at [0026]:</p> <p>Typically, the filter takes the form of opposing, water-permeable paper sheets, as indicated, but the filter may be formed of stainless steel, or some other filter material configured to define a cavity for containment of coffee grounds while water and brewed coffee beverage pass therethrough. It is desirable, however, that the filter impart no undesirable taste characteristics to the resulting coffee beverage.</p> <p>Jarisch at [0007]:</p> <p>Recognition means can comprise one or more strips of a magnetic material applied to the body of the package, which can be read by an appropriate magnetic sensor, one or more shaped or divided areas of metal foil applied to the package body which cause an inductive effect on</p>
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	<p>movement of the package in the machine, which inductive effect can be sensed; or one or more electrically conductive areas formed on the body of the package which can be sensed electrically.</p> <p>Jarisch at [0093]-[0095]:</p> <p>-Printing on the inner surface of a capsule container, using the curl as information support (Aluminum capsule technology)</p> <p><u>4) Inductive code reading:</u></p> <p>Another mode consists in sensing a code provided on a metallic surface of the capsule using an inductive sensor. The code is formed by reliefs or recesses in the metallic surface.</p> <p>Mahlich at [0005]:</p> <p>The single-serving capsules consist mostly of a deep-drawn plastic or aluminium foil and their advantage, when compared to pouches, lies in the fact that they have an air-tight seal and that certain manufacturers fill them with a protective gas containing the coffee aroma as well. Such pre-proportioned single-serving units are available for approximately 10 different coffee fillings. Due to this variety the consumer is able to stock smaller amounts of different types of coffee. In addition, the use of these single-serving units in conjunction with the special brewing heads of those espresso machines equipped to process such single-serving units results in a reliably constant optimum brew.</p> <p>Mock at [0026]:</p> <p>“The packaging comprises a side wall, an end wall and a closure element comprising a welded seal.”</p> <p>Mock at [0027]:</p> <p>“The packaging according to the invention may be produced with very diverse shapes and in very diverse materials. It may be rigid, for example made of thermoforming plastic or</p>
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	<p>stamping thin metal sheet, for example made of aluminum, and have an outline that is, for example, circular, rectangular or hexagonal.”</p> <p>Panesar at p. 9, ll. 8–23:</p> <p><u>Cartridge for use in the system</u></p> <p>As shown in Figure 10 to 21, the cartridge 1 generally comprises an outer member 2, an inner member 3 and a laminate 5. The outer member 2, inner member 3 and laminate 5 are assembled to form the cartridge 1 which has an interior 120 for containing one or more beverage ingredients, an inlet 121, an outlet 122 and a beverage flow path linking the inlet 121 to the outlet 122 and which passes through the interior 120. The inlet 121 and outlet 122 are initially sealed by the laminate 5 and are opened in use by piercing or cutting of the laminate 5. The beverage flow path is defined by spatial inter-relationships between the outer member 2, inner member 3 and laminate 5 as discussed below. Other components may optionally be included in the cartridge 1, such as a filter 4, as will be described further below.</p> <p>Panesar at p. 14, ll. 21–32:</p> <p>The laminate 5 is formed from two layers, a first layer of aluminium and a second layer of cast polypropylene. The aluminium layer is between 0.02 and 0.07 mm in thickness. The cast polypropylene layer is between 0.025 and 0.065 mm in thickness. In one embodiment the aluminium layer is 0.06 mm and the polypropylene layer is 0.025 mm thick. This laminate is particularly advantageous as it has a high resistance to curling during assembly. As a result the laminate 5 may be pre-cut to the correct size and shape and subsequently transferred to the assembly station on the production line without undergoing distortion. Consequently, the laminate 5 is particularly well suited to welding. Other laminate materials may be used including PET/Aluminium/PP, PE/EVOH/PP, PET/metallised/PP and Aluminium/PP laminates. Roll laminate stock may be used instead of die cut stock. The cartridge 1 may be closed by a rigid or semi-rigid lid instead of a flexible laminate.</p> <p><i>See also</i> Panesar at FIGs. 10-21.</p>
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	<p>Yoakim at [0129]:</p> <p>The capsule can also comprise a cup-shaped body onto which the sealing lid is sealed. The cup-shaped body may also comprise gas barrier materials, such as metal, e.g., thin aluminium and/or plastic.</p> <p>Yoakim at [0215]:</p> <p>The body of the capsule can be made of plastic and/or aluminium or aluminium alloy. For example, it can be moulded by injection of plastic or deep drawn in aluminium.</p> <p>Yoakim at [0461]:</p> <p>FIGS. 45 to 50 are other variants of capsules according to the invention. For example, the capsule of FIG. 45 has a cylindrical side wall 700, an upper wall 701 and a lower wall 702 both sealed or connected to the sidewall 700. The capsule is gastight by choosing materials for the walls, e.g., aluminium and/or suitable plastics, which have gas barrier properties.</p> <p><i>See also, e.g.,</i> Yoakim at [0414].</p>
[1.g] and radially spaced and vertically oriented grooves,	<p>The below cited art discloses, either expressly or inherently, radially spaced and vertically oriented grooves. <i>See, e.g.:</i></p> <p>Boyd at [0015]:</p> <p>FIG. 2 g is a fragmentary view of an alternative embodiment packet, illustrating encoded data in the form of grooves.</p> <p>Boyd at [0029]:</p> <p>Examples of alternative embodiments are depicted in FIGS. 2 b through 2 h. In FIG. 2b the feature is geometric shape 32. The shape may be raised or lowered and may, or may not incorporate color, or some other machine-interpretable characteristic. FIG. 2c shows text string 33. The text string may consist of alpha-numeric characters and may be of various</p>

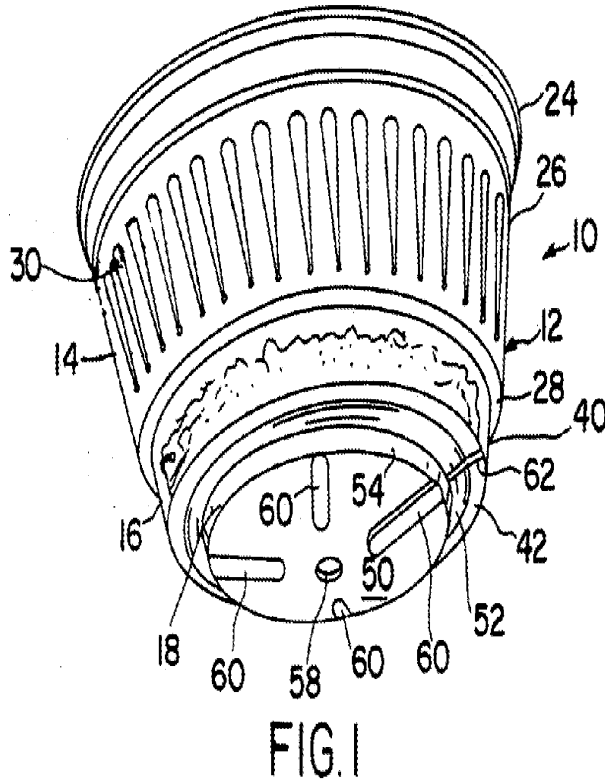
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	<p>lengths including a single character. FIG. 2d shows glyph 34. The glyph may be any symbolic figure including a symbol used as a trademark. A digital watermark 35 is depicted in FIG. 2e. FIG. 2f shows notches 36. The notches may be localized to a particular area of the packet or may span its entire perimeter in singular or repetitive fashion. Grooves 37 are depicted in FIG. 2g. One or more grooves may be incorporated to create a texture. FIG. 2h shows holes. One or more holes may be used, which holes may be, of various shapes and sizes. The above-noted machine interpretable features; or other machine interpretable features, may similarly may be employed in combination or alone, such features being selected for their ability to store brewing directives and packet and/or ingredient-characteristic data, and for their cost of manufacture, aesthetic appearance, and ability to carry machine interpretal features which are capable of being successfully detected, read, and interpreted.</p> <p>Boyd at Fig. 2g:</p>  <p>FIG. 2g</p> <p>Erickson at 5:9-26:</p> <p>The reservoir 14 of the container 12 is open at the top and includes a rim 24, a depending side wall 26 and a bottom wall 28. The rim 24 extends laterally and outwardly from the upper end of the wall 26 to facilitate pouring of the water or other liquid into the reservoir and movement of the coffee maker 10 without spilling. The wall 26 is cylindrical and is stepped and tapered inwardly and includes vertical ribs 30 for strengthening. The bottom wall 28, in the illustrative embodiment, is in the form of an annular shoulder and includes a relatively large central opening 32. As illustrated, the reservoir 14 of the invention is configured to contain the appropriate amount of water necessary to brew the desired amount of coffee and</p>
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to provide the necessary hydrostatic pressure to the partition 20 to cause the partition 20 to allow the flow of water therethrough at the desired brewing temperature.

Erickson at Fig. 1:



Lazaris at [0028]:

A typical beverage filter cartridge is depicted at 50 in FIGS. 7 and 8A. The cartridge includes a cup-shaped base 51 having an inverted frustum-shaped side wall interrupted by surface irregularities indicated typically at 52 and comprising circumferentially spaced grooves. The cup-shaped base is closed by a lid 53. As herein employed, the term “surface irregularity” is intended to broadly encompass any deviation from a smooth surface that can mechanically interengage with adjacent components or surfaces of the housing 28. Non limiting examples

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	<p>of such surface irregularities may comprise a uniform array of grooves as shown in FIG. 8A, or pairs of oppositely disposed grooves 52 a in the side wall of a cartridge 50 a as shown in FIG. 8B, or a single surface irregularity such as the outwardly projecting rib 54 b in the side wall of cartridge 50 b as shown in FIG. 8C.</p> <p>Lazaris at [0039]:</p> <p>FIG. 6 illustrates an alternative embodiment of a cartridge holder in which the side wall of the housing 28 is provided with internal grooves 300" configured and arranged to slidably receive and coact in mechanical interengagement with externally projecting ribs 52 c in the side wall of cartridge 50 c Still another embodiment of a cartridge holder is illustrated in FIGS. 9-11. The cartridge 50 d is of the type described in the above-referenced patent application Ser. No. 09/782,660, with generally flat side walls diverging upwardly from a bottom to a top opening closed by a lid 53 a. Oppositely facing side walls are provided with surface irregularities in the form of protruding somewhat triangular-shaped bosses 52 d.</p> <p>Lazaris at [0041]:</p> <p>The recesses 301 in the housing side walls coact with the bosses 52 d in the cartridge side wall to orientate the cartridge within the housing in one of two possible positions.</p> <p>Lazaris at Fig. 7:</p>
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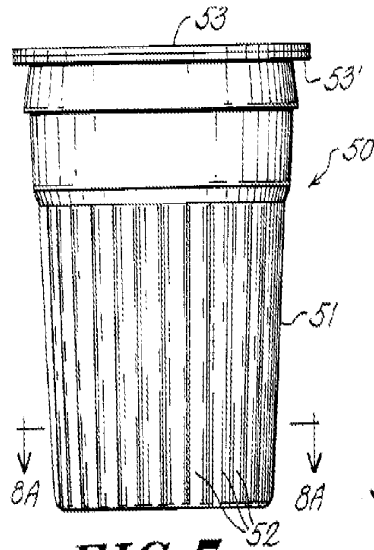


FIG. 7

See also Lazaris at Fig. 8A.

Mariller at [0020]-[0032]:

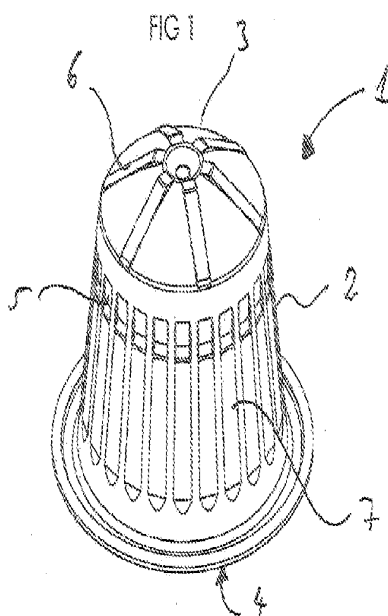
List of numerical references used in the figures:

1. capsule
2. side wall
3. top wall
4. bottom wall
5. cavity
6. top wall stiffening element
7. side wall stiffening element
8. top edge stiffening element
9. internal protrusion
10. beading
11. weakened zone
12. piercing element

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	<p>Mariller at [0034]:</p> <p>a) The top part of the capsule is reinforced by an architecture known as an “exposed beams”, “reinforcing” or “framework” architecture the purpose of which is to reinforce the capsule in its ability to withstand the pressure of the water and at the time of its perforation. It is also possible to obtain a reinforced structure using folds of material. The rigidity may also be reinforced using an architecture of the “exposed beams” or “framework” type which is concave in relation to the capsule (see FIG. 2).</p> <p>Mariller at [0037]-[0038]:</p> <p>c) On the outside of the capsule, opposite each projecting element or opposite a circumferential rim, a cavity is created which strengthens the lateral parts of the capsule through a framework effect while at the same time saving on material (see cross section) and in particular allows the use of biodegradable material and fine materials of the PET or metal type or any other petroleum-derived material. The lateral reinforcement of the capsule may also be created by folds of the material (see FIGS. 5-6).</p> <p>d) The outer lateral part of the capsule has facets which may extend as far as the vicinity of the bottom part of the capsule or over a certain distance in the heightwise direction. In this alternative form also, it is therefore possible to save on material while at the same time reinforcing the lateral parts of the capsule (see FIGS. 7-8).</p> <p>Mariller at Fig. 1:</p>
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See also Mariller at Figs. 2, 7, 8.

Mock at [0027]:

The packaging according to the invention may be produced with very diverse shapes and in very diverse materials. It may be rigid, for example made of thermoforming plastic or stamping thin metal sheet, for example made of aluminum, and have an outline that is, for example, circular, rectangular or hexagonal.

Mock at [0036]:

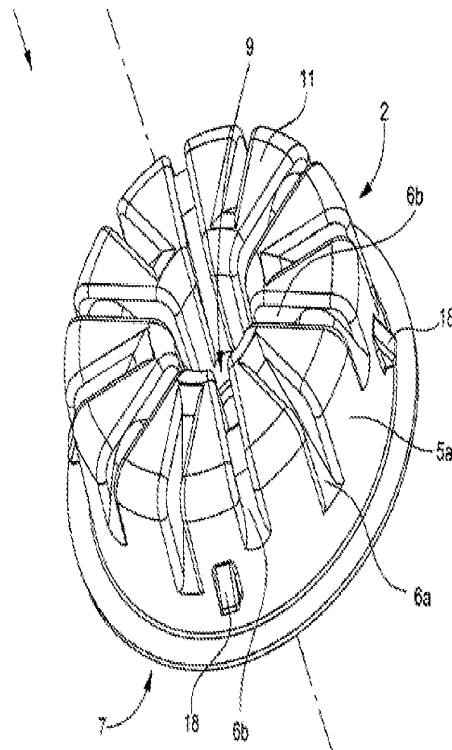
According to another preferred embodiment, the part of the packaging from which the hollow shaft departs is produced with strengthening ribs and/or with ribs for positioning the nozzle, these ribs being formed, for example by thermoforming, as recesses in the end wall and the wall and being orientated toward the hollow shaft.

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Mock at [0077]:

As can also be seen in FIGS. 2 and 3, in this first embodiment, the capsule 2 has ribs 6a, 6b extending from the hollow shaft 9 to the periphery. A first series of ribs 6a plays a part in reinforcing the capsule 2, and possibly in partitioning it as will be seen later on. A second series of ribs 6b is designed to prevent the nozzle from rotating in the packaging, as will be explained with reference to FIGS. 6 and 7. . . .

Mock at FIGs. 1-2:



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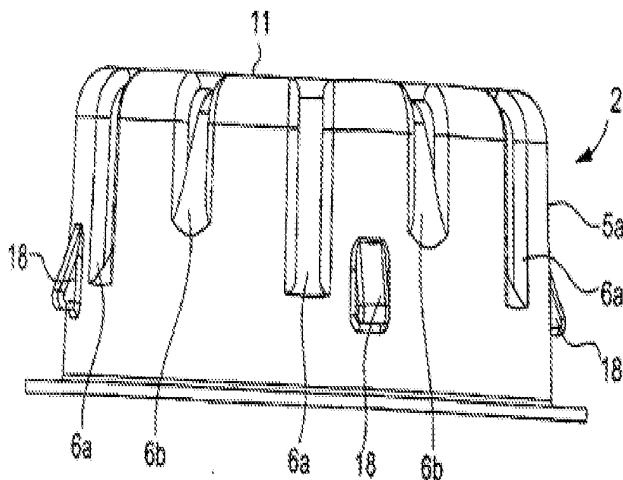


Fig.2

Rapparini at [0007]:

The present invention allows overcoming the problems and drawbacks of the systems known in the prior art. In particular, the present invention guarantees stability of the structure of filtering and permeable containers so that they can be easily handled in packaging and/or filling machines even when these machines operate at very high rates. Moreover, the present invention provides containers which are easily employed in automatic machines both for domestic and industrial use.

Rapparini at [0009]:

The present invention is based on the idea of providing the body of the container with longitudinal stiffening ribs wherein the length of the ribs is variable along the surface of the body. The presence of ribs having different lengths on the body of the container allows the optimization of the stability of the container. The modulation of the length of the ribs along the surface of the container allows improving the stability and rigidity of the system.

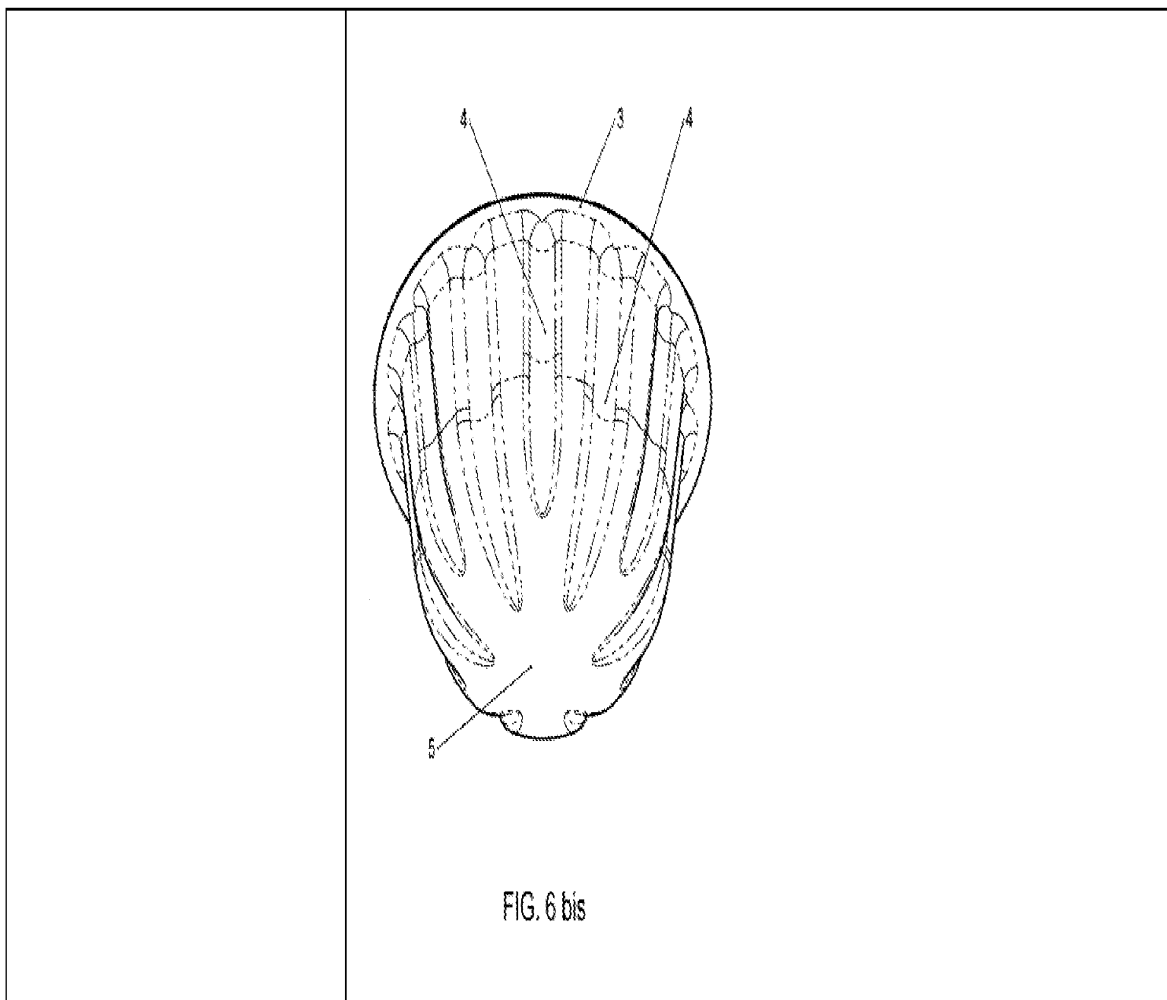
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	<p>Rapparini at [0010]:</p> <p>According to an embodiment of the present invention, a filtering and permeable container for substances suitable for the preparation of beverages is provided, the container being made by means of thermoforming starting from a flat strip of permeable, filtering and thermoformable material, wherein the body of the container comprises longitudinal stiffening ribs, wherein the length of the ribs is variable along the surface of the body.</p> <p>Rapparini at [0011]:</p> <p>According to a further embodiment of the present invention, a container is provided, wherein long and short ribs are alternated along the surface of the body. The stability of the container is accordingly optimized by providing for example long ribs extending at least partially in the bottom region of the container alternated to short ribs extending only along the side region of the container.</p> <p>Rapparini at [0013]:</p> <p>According to a further embodiment of the present invention, a container is provided, wherein at least along a portion of one or more of the ribs, the width of the ribs decreases toward the bottom of the container, so that said one or more of the ribs have a pointed shape. In this way the stability of the container is further optimized. In particular, the side portion of the body is stiffened by the presence of the stiffening ribs and the bottom portion is minimally altered by the presence of those ribs having a pointed shape pointing toward the bottom of the container.</p> <p>Rapparini at [0014]:</p> <p>According to a further embodiment of the present invention, a container is provided, wherein the stiffening ribs increase the filtering surface of the body.</p> <p>Rapparini at [0019]:</p>
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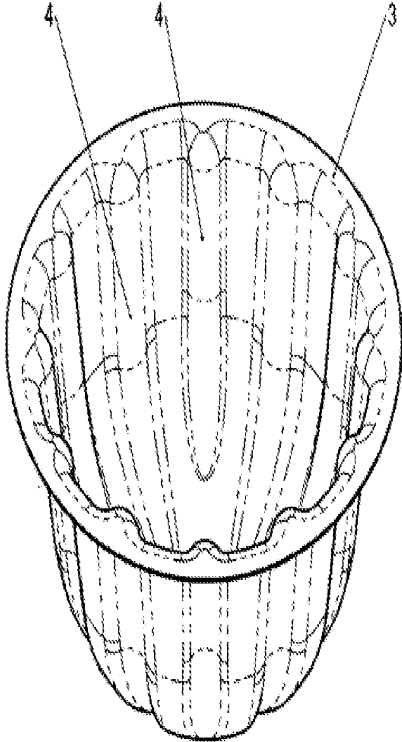
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	<p>According to a further embodiment of the present invention, a container is provided, wherein the container is adapted to be employed in automatic espresso machines. In particular, the container can be adapted to be employed for example for automatic domestic espresso machines or for industrial espresso machines.</p> <p>Rapparini at [0052]:</p> <p>Figures 6 and 6bis schematically display 3D views of the container according to an embodiment of the present invention. The container is provided with longitudinal stiffening ribs 4, and the length L of the stiffening ribs 4 is variable along the surface of the body 2 of the container. In particular, long and short ribs are alternated along the surface of the body 2. The long ribs extends toward the bottom region 5 of the container. In particular, the long ribs occupy a portion of the bottom region 5 of the container. The container has a cup-shaped bottom region 5. The long stiffening ribs occupy, therefore, a portion of the cup-shaped bottom region 5. Each short rib is placed between two long ribs and extends along the lateral region of the container. Accordingly, the stabilization of the structure is optimized and, at the same time, the filtering surface of the container is increased.</p> <p>Rapparini at FIG. 6 bis:</p>
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	<p>Rapparini at FIG. 6:</p>  <p>Rubino at [0009]:</p> <p>The present invention provides several relevant advantages. The main advantage lies in the fact that the internal grooves of the capsule attain optimal flow conditions for the liquid passing through the capsule itself, to the advantage of the quality and repeatability of the end beverage and also of the correct operation of the associated machines, which are not subject to unforeseeably variable flow conditions.</p> <p>Rubino at [0012]:</p>
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	<p>The capsule 1 comprises a main body of substantially cylindrical overall geometry, which has just a longitudinal axis of symmetry A. In particular, the main body is comprised of a top face 2 and a bottom face 3 having a substantially circular contour, and of a lateral surface or skirt 4 bearing a plurality of grooves that will be detailed hereinafter. Such top and bottom faces 2 and 3 and lateral skirt 4 define an internal housing 10 of the capsule 1, better seen in Figures 7 and 8, receiving the ground coffee.</p> <p>Rubino at [0018]-[0019]:</p> <p>As mentioned above, in correspondence of its lateral skirt 4 the main body of the capsule 1 has a plurality of concave external grooves 5, identical the one to the other and equally distributed over the entire lateral extension of the skirt 4 itself according to an axial geometry. The grooves 5 develop in a direction substantially parallel to axis A of the capsule 1 and are partitioned by external longitudinal ribs 52. Also the latter are identical the one to the other, equally distributed over the entire lateral extension of the skirt 4, and develop along a direction substantially parallel to the axis A of the capsule 1.</p> <p>As it is better seen in Figure 8, the external ribs 52 are internally hollow, thereby producing in correspondence of the housing 10 a plurality of grooves or internal notches 50 of the capsule itself. Therefore, said internal notches 50 define longitudinal portions of the housing 10 inside which part of the ground coffee is received. The presence and arrangement of the notches 50 allows, as already mentioned above, optimal conveyance of the extraction fluid within the capsule 1, preventing stagnation, allowing to accurately control and foresee the properties of said flow and generally to optimize the extraction process.</p> <p>Rubino at Claim 1:</p> <p>A capsule (1) of the type containing or apt to contain a substantially granular infusion for making beverages such as coffee and the like in an extraction process providing the passing through the capsule itself by an extraction fluid, said capsule (1) comprising a main body (2, 3, 4) defining an internal housing (10) apt to receive said infusion (C), characterized in that said main body (2, 3, 4) has, in correspondence of at least part of the lateral wall (4) of said housing (10), a plurality of internal longitudinal grooves (50) arranged substantially in the</p>
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direction of the extraction fluid flow and apt to convey such a fluid through the capsule (1) itself.

Rubino at Fig. 8:

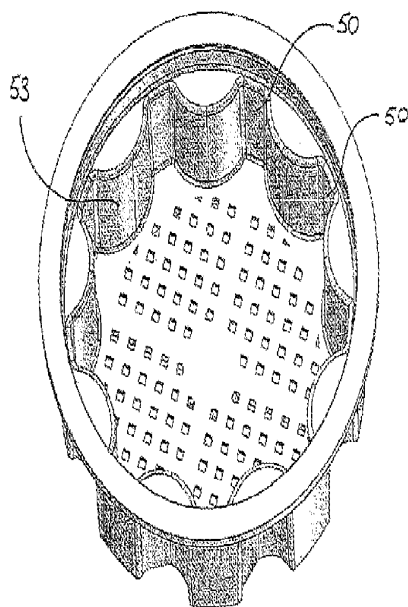


FIG. 8

See also Rubino at Claims 2, 3, 6; Figs. 1-4, 7.

Sweeney at Abstract:

A beverage filter cartridge includes a cup-shaped outer container with a bottom and a side wall extending upwardly from the bottom wall to a circular rim surrounding an upper opening. The side wall has an upper section extending downwardly from the rim to an intermediate section, and a tapered lower section configured to provide a plurality of circumferentially spaced flutes extending downwardly from the intermediate section to the

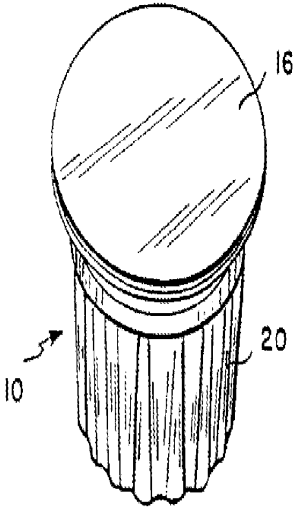
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	<p>bottom wall. A filter element subdivides the interior of the container into first and second chambers. A beverage medium is stored in the first chamber. A cover is joined to the side wall at the rim to close the upper opening. The cover is yieldably piercable to accommodate an injection of liquid into the first chamber for combination with the beverage medium to produce a beverage. The filter element is permeable to accommodate a flow of the beverage from the first chamber into the second chamber, and the bottom wall is yieldably piercable to accommodate an outflow of the beverage from the second chamber to the exterior of the cartridge.</p> <p>Sweeney at 2:20-35</p> <p>In accordance with the present invention, the container side wall is provided with circumferentially spaced flutes which are strategically positioned to enhance resistance to buckling without interfering with or compromising the integrity of the seal between the side wall and the filter component. The location at which the filter component is joined to the interior side wall of the container is lowered to achieve a beneficial increase in beverage medium storage capacity. This location is defined by a tapered circular ledge against which the tapered filter component is reliably sealed.</p> <p>The channels formed between the circumferentially spaced flutes serve to efficiently direct the brewed beverage downwardly towards the pierced container bottom, with an accompanying beneficial increase in turbulence in the head space defined between the filter element and container side wall.</p> <p>Sweeney at 2:47-55</p> <p>In a third embodiment of the present invention, the circumferentially spaced flutes protrude sufficiently inwardly into the container interior to radially contact the filter element at circumferentially spaced locations. This radial contact beneficially guides the filter element into its centrally located position during assembly of the cartridge components, and, during the processing cycle, provides radial support which resists distortion and possible bursting of the filter element.</p>
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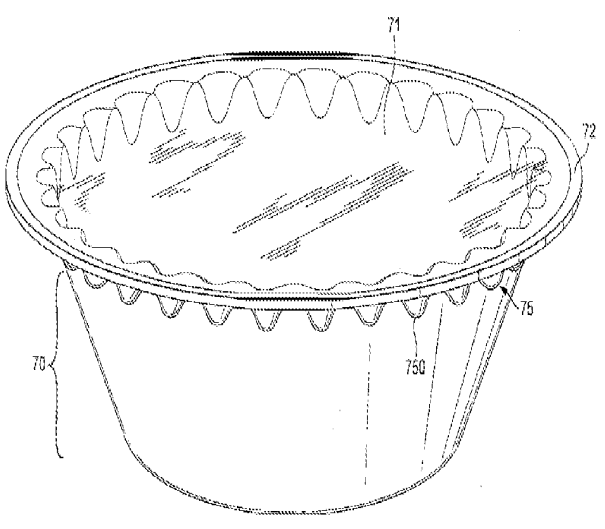
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	<p>Sweeney at 3:65-4:8</p> <p>The lower tapered wall section 20 c is configured to provide a plurality of circumferentially spaced flutes 20 e, the upper ends of which terminate beneath the intermediate section defined by ledge 20 b, and the lower ends of which terminate as indentations in the bottom wall 18.</p> <p>It will be seen from FIG. 8 that the depths “d” of the flutes 20 e gradually increase from a minimum at their upper ends to a maximum at their lower ends. Likewise, as can be seen from FIG. 7, the widths “w” of the flutes also gradually increase from a minimum at their upper ends to a maximum at their lower ends.</p> <p>Sweeney at 5:11-19</p> <p>In all embodiments, the downwardly diverging and gradually deepening of the flutes serves to promote downward flow of the brewed beverage in chamber B while beneficially encouraging turbulence. The upwardly protruding bosses 18 a, 318 a on the container bottoms of the first and third embodiments provide readily accessible support platforms for the bottoms of the filter elements. Securing the bottoms of the filter elements to the bosses 18 a, 218 a insures that the filter elements will not be punctured by the outlet probe 30.</p> <p>Sweeney at Fig. 1:</p>
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	 <p>FIG. 1</p> <p><i>See also Sweeney at Figs. 2, 3, 5, 7, 9-11, and 15.</i></p> <p>Yoakim at [0161]:</p> <p>In yet another embodiment, the surface of the capsule comprises a toothed structure.</p> <p>Yoakim at [0215]:</p> <p>FIG. 23 illustrates another capsule of the invention. The capsule comprises means for connecting it to the external rotational driving means of the device. For this, capsule has a toothed structure 75 on at least one of its outer surface. The capsule has a body 70 comprising an upper edge 72 which can be closed by an upper membrane 71. The toothed structure comprises a series of teeth which is positioned below the edge or rim 72 of the body of the capsule. The teeth are placed along the whole periphery of the body of the capsule. The body of the capsule can be made of plastic and/or aluminium or aluminium alloy. For example, it can be moulded by injection of plastic or deep drawn in aluminium. For example, the shape of the teeth could be slightly triangular, oval, rectangular or pyramidal. It should be noticed that the</p>
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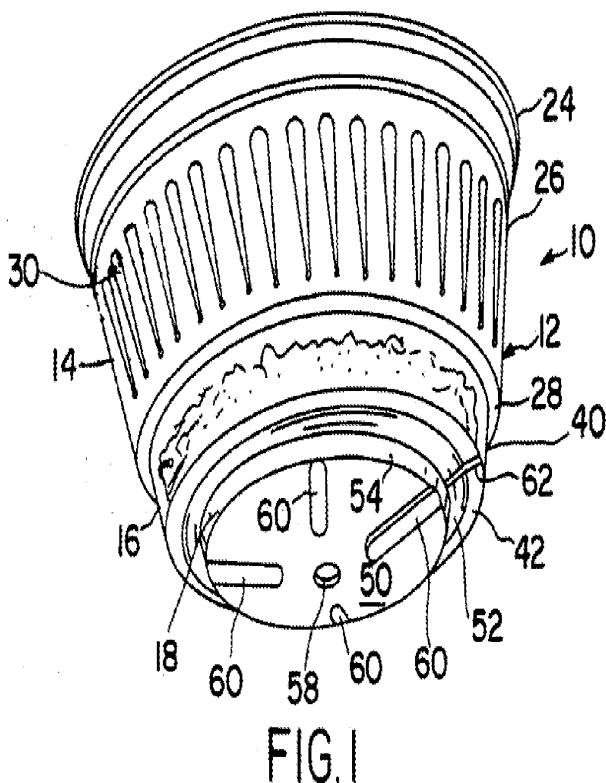
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	<p>teeth could be replaced by other equivalent structures such as series of elements in relief and/or hollow. For example, slits, pins or small needles can be envisaged.</p> <p>Yoakim at [0216]:</p> <p>The device itself that receives the capsule of FIG.23 comprises a toothed surface of complementary shape. FIG. 24 shows a capsule holder 44 adapted to receive the capsule of FIG. 23. The capsule holder has a cavity into which are provided hollow teeth 440. The hollow teeth are arranged to fit the teeth 750 on the outer surface of the capsule.</p> <p>Yoakim at FIG. 23:</p>  <p>FIG. 23</p>
[1.h] the cavity has radially spaced and vertically oriented ribs,	The below cited art discloses, either expressly or inherently, the cavity has radially spaced and vertically oriented ribs. <i>See, e.g.:</i>

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	<p><i>See</i> [1.g].</p> <p>Erickson at 5:9-26:</p> <p>The reservoir 14 of the container 12 is open at the top and includes a rim 24, a depending side wall 26 and a bottom wall 28. The rim 24 extends laterally and outwardly from the upper end of the wall 26 to facilitate pouring of the water or other liquid into the reservoir and movement of the coffee maker 10 without spilling. The wall 26 is cylindrical and is stepped and tapered inwardly and includes vertical ribs 30 for strengthening. The bottom wall 28, in the illustrative embodiment, is in the form of an annular shoulder and includes a relatively large central opening 32. As illustrated, the reservoir 14 of the invention is configured to contain the appropriate amount of water necessary to brew the desired amount of coffee and to provide the necessary hydrostatic pressure to the partition 20 to cause the partition 20 to allow the flow of water therethrough at the desired brewing temperature.</p> <p>Erickson at Fig. 1:</p>
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Lazaris at [0012]:

In other embodiments of the present invention the interior surface of the housing is contoured to coact in mechanical interengagement with the surface irregularities in the cartridge side wall.

Lazaris at [0028]:

A typical beverage filter cartridge is depicted at 50 in FIGS. 7 and 8A. The cartridge includes a cup-shaped base 51 having an inverted frustum-shaped side wall interrupted by surface irregularities indicated typically at 52 and comprising circumferentially spaced grooves. The cup-shaped base is closed by a lid 53. As herein employed, the term “surface irregularity” is intended to broadly encompass any deviation from a smooth surface than can mechanically

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	<p>interengage with adjacent components or surfaces of the housing 28. Non limiting examples of such surface irregularities may comprise a uniform array of grooves as shown in FIG. 8A, or pairs of oppositely disposed grooves 52 a in the side wall of a cartridge 50 a as shown in FIG. 8B, or a single surface irregularity such as the outwardly projecting rib 54 b in the side wall of cartridge 50 b as shown in FIG. 8C.</p> <p>Lazaris at [0039]:</p> <p>FIG. 6 illustrates an alternative embodiment of a cartridge holder in which the side wall of the housing 28 is provided with internal grooves 300" configured and arranged to slidably receive and coact in mechanical interengagement with externally projecting ribs 52 c in the side wall of cartridge 50 c Still another embodiment of a cartridge holder is illustrated in FIGS. 9-11. The cartridge 50 d is of the type described in the above-referenced patent application Ser. No. 09/782,660, with generally flat side walls diverging upwardly from a bottom to a top opening closed by a lid 53 a. Oppositely facing side walls are provided with surface irregularities in the form of protruding somewhat triangular-shaped bosses 52 d.</p> <p>Lazaris at [0041]:</p> <p>The recesses 301 in the housing side walls coact with the bosses 52 d in the cartridge side wall to orientate the cartridge within the housing in one of two possible positions.</p> <p>Lazaris at Fig. 7:</p>
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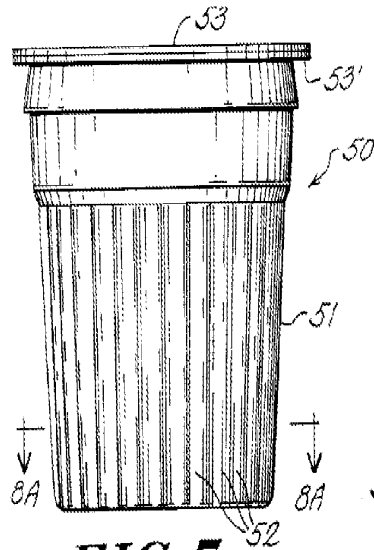


FIG. 7

See also Lazaris at Fig. 8A.

Mariller at [0020]-[0032]:

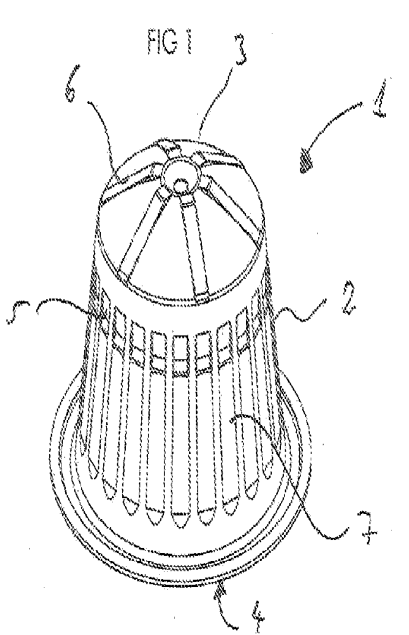
List of numerical references used in the figures:

1. capsule
2. side wall
3. top wall
4. bottom wall
5. cavity
6. top wall stiffening element
7. side wall stiffening element
8. top edge stiffening element
9. internal protrusion
10. beading
11. weakened zone
12. piercing element

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	<p>Mariller at [0034]:</p> <p>a) The top part of the capsule is reinforced by an architecture known as an “exposed beams”, “reinforcing” or “framework” architecture the purpose of which is to reinforce the capsule in its ability to withstand the pressure of the water and at the time of its perforation. It is also possible to obtain a reinforced structure using folds of material. The rigidity may also be reinforced using an architecture of the “exposed beams” or “framework” type which is concave in relation to the capsule (see FIG. 2).</p> <p>Mariller at [0037]-[0038]:</p> <p>c) On the outside of the capsule, opposite each projecting element or opposite a circumferential rim, a cavity is created which strengthens the lateral parts of the capsule through a framework effect while at the same time saving on material (see cross section) and in particular allows the use of biodegradable material and fine materials of the PET or metal type or any other petroleum-derived material. The lateral reinforcement of the capsule may also be created by folds of the material (see FIGS. 5-6).</p> <p>d) The outer lateral part of the capsule has facets which may extend as far as the vicinity of the bottom part of the capsule or over a certain distance in the heightwise direction. In this alternative form also, it is therefore possible to save on material while at the same time reinforcing the lateral parts of the capsule (see FIGS. 7-8).</p> <p>Mariller at Fig. 1:</p>
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	<p data-bbox="649 315 1055 945"></p> <p data-bbox="609 1008 893 1060"><i>See also Mariller at Figs. 2, 7, 8.</i></p> <p data-bbox="609 1092 747 1134">Mock at [0027]:</p> <p data-bbox="609 1165 1421 1333">The packaging according to the invention may be produced with very diverse shapes and in very diverse materials. It may be rigid, for example made of thermoforming plastic or stamping thin metal sheet, for example made of aluminum, and have an outline that is, for example, circular, rectangular or hexagonal.</p> <p data-bbox="609 1375 747 1417">Mock at [0036]:</p> <p data-bbox="609 1459 1421 1627">According to another preferred embodiment, the part of the packaging from which the hollow shaft departs is produced with strengthening ribs and/or with ribs for positioning the nozzle, these ribs being formed, for example by thermoforming, as recesses in the end wall and the wall and being orientated toward the hollow shaft.</p>
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Mock at [0077]:

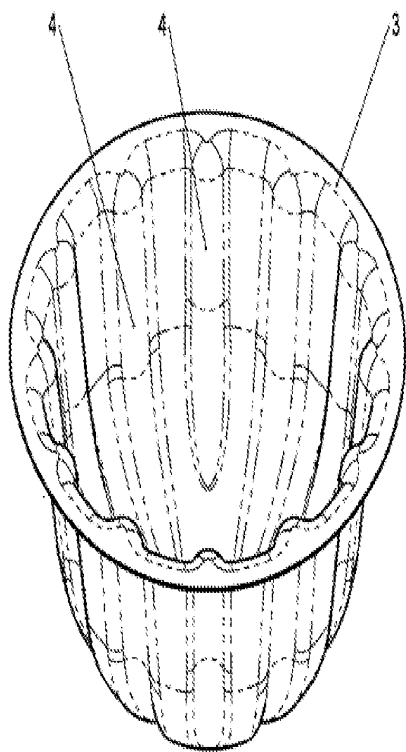
As can also be seen in FIGS. 2 and 3, in this first embodiment, the capsule 2 has ribs 6a, 6b extending from the hollow shaft 9 to the periphery. A first series of ribs 6a plays a part in reinforcing the capsule 2, and possibly in partitioning it as will be seen later on. A second series of ribs 6b is designed to prevent the nozzle from rotating in the packaging, as will be explained with reference to FIGS. 6 and 7 . . .

See FIG. 3.

Fig.3

Rapparini at FIG. 6:

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Rubino at [0009]:

The present invention provides several relevant advantages. The main advantage lies in the fact that the internal grooves of the capsule attain optimal flow conditions for the liquid passing through the capsule itself, to the advantage of the quality and repeatability of the end beverage and also of the correct operation of the associated machines, which are not subject to unforeseeably variable flow conditions.

Rubino at [0012]:

The capsule 1 comprises a main body of substantially cylindrical overall geometry, which has just a longitudinal axis of symmetry A. In particular, the main body is comprised of a top face 2 and a bottom face 3 having a substantially circular contour, and of a lateral surface or skirt 4

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	<p>bearing a plurality of grooves that will be detailed hereinafter. Such top and bottom faces 2 and 3 and lateral skirt 4 define an internal housing 10 of the capsule 1, better seen in Figures 7 and 8, receiving the ground coffee.</p> <p>Rubino at [0018]-[0019]:</p> <p>As mentioned above, in correspondence of its lateral skirt 4 the main body of the capsule 1 has a plurality of concave external grooves 5, identical the one to the other and equally distributed over the entire lateral extension of the skirt 4 itself according to an axial geometry. The grooves 5 develop in a direction substantially parallel to axis A of the capsule 1 and are partitioned by external longitudinal ribs 52. Also the latter are identical the one to the other, equally distributed over the entire lateral extension of the skirt 4, and develop along a direction substantially parallel to the axis A of the capsule 1.</p> <p>As it is better seen in Figure 8, the external ribs 52 are internally hollow, thereby producing in correspondence of the housing 10 a plurality of grooves or internal notches 50 of the capsule itself. Therefore, said internal notches 50 define longitudinal portions of the housing 10 inside which part of the ground coffee is received. The presence and arrangement of the notches 50 allows, as already mentioned above, optimal conveyance of the extraction fluid within the capsule 1, preventing stagnation, allowing to accurately control and foresee the properties of said flow and generally to optimize the extraction process.</p> <p>Rubino at Claim 1:</p> <p>A capsule (1) of the type containing or apt to contain a substantially granular infusion for making beverages such as coffee and the like in an extraction process providing the passing through the capsule itself by an extraction fluid, said capsule (1) comprising a main body (2, 3, 4) defining an internal housing (10) apt to receive said infusion (C), characterized in that said main body (2, 3, 4) has, in correspondence of at least part of the lateral wall (4) of said housing (10), a plurality of internal longitudinal grooves (50) arranged substantially in the direction of the extraction fluid flow and apt to convey such a fluid through the capsule (1) itself.</p>
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Rubino at Fig. 8:

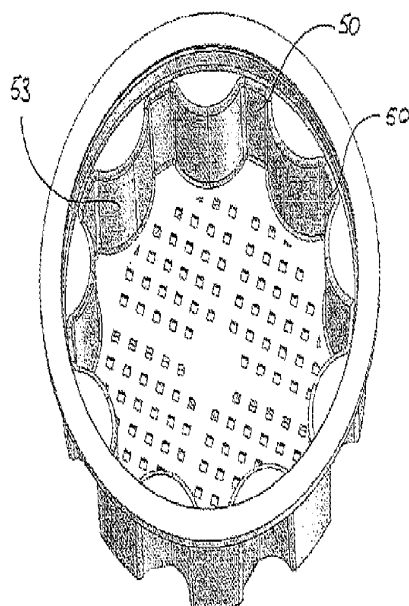


FIG. 8

See also Rubino at Claims 2, 3, 6; Figs. 1-4, 7.

Sweeney at Abstract:

A beverage filter cartridge includes a cup-shaped outer container with a bottom and a side wall extending upwardly from the bottom wall to a circular rim surrounding an upper opening. The side wall has an upper section extending downwardly from the rim to an intermediate section, and a tapered lower section configured to provide a plurality of circumferentially spaced flutes extending downwardly from the intermediate section to the bottom wall. A filter element subdivides the interior of the container into first and second chambers. A beverage medium is stored in the first chamber. A cover is joined to the side wall at the rim to close the upper opening. The cover is yieldably pierceable to accommodate

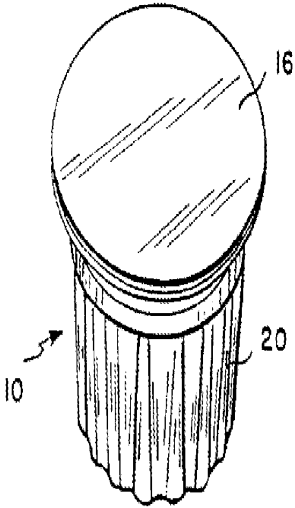
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	<p>an injection of liquid into the first chamber for combination with the beverage medium to produce a beverage. The filter element is permeable to accommodate a flow of the beverage from the first chamber into the second chamber, and the bottom wall is yieldably piercable to accommodate an outflow of the beverage from the second chamber to the exterior of the cartridge.</p> <p>Sweeney at 2:20-35</p> <p>In accordance with the present invention, the container side wall is provided with circumferentially spaced flutes which are strategically positioned to enhance resistance to buckling without interfering with or compromising the integrity of the seal between the side wall and the filter component. The location at which the filter component is joined to the interior side wall of the container is lowered to achieve a beneficial increase in beverage medium storage capacity. This location is defined by a tapered circular ledge against which the tapered filter component is reliably sealed.</p> <p>The channels formed between the circumferentially spaced flutes serve to efficiently direct the brewed beverage downwardly towards the pierced container bottom, with an accompanying beneficial increase in turbulence in the head space defined between the filter element and container side wall.</p> <p>Sweeney at 2:47-55</p> <p>In a third embodiment of the present invention, the circumferentially spaced flutes protrude sufficiently inwardly into the container interior to radially contact the filter element at circumferentially spaced locations. This radial contact beneficially guides the filter element into its centrally located position during assembly of the cartridge components, and, during the processing cycle, provides radial support which resists distortion and possible bursting of the filter element.</p> <p>Sweeney at 3:65-4:8</p>
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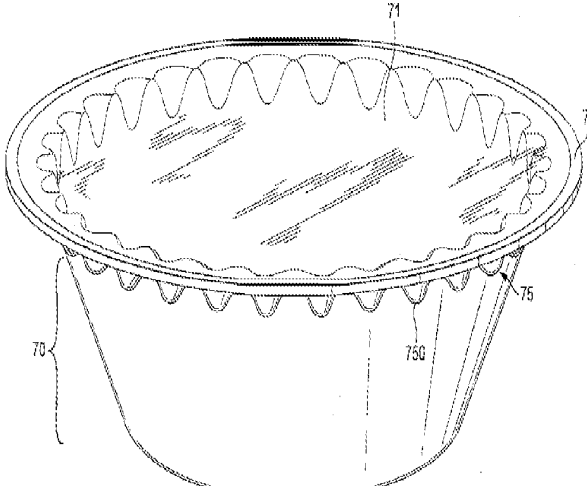
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	<p>The lower tapered wall section 20 c is configured to provide a plurality of circumferentially spaced flutes 20 e, the upper ends of which terminate beneath the intermediate section defined by ledge 20 b, and the lower ends of which terminate as indentations in the bottom wall 18.</p> <p>It will be seen from FIG. 8 that the depths “d” of the flutes 20 e gradually increase from a minimum at their upper ends to a maximum at their lower ends. Likewise, as can be seen from FIG. 7, the widths “w” of the flutes also gradually increase from a minimum at their upper ends to a maximum at their lower ends.</p> <p>Sweeney at 5:11-19</p> <p>In all embodiments, the downwardly diverging and gradually deepening of the flutes serves to promote downward flow of the brewed beverage in chamber B while beneficially encouraging turbulence. The upwardly protruding bosses 18 a, 318 a on the container bottoms of the first and third embodiments provide readily accessible support platforms for the bottoms of the filter elements. Securing the bottoms of the filter elements to the bosses 18 a, 218 a insures that the filter elements will not be punctured by the outlet probe 30.</p> <p>Sweeney at Fig. 1:</p>
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	 <p>FIG. 1</p> <p><i>See also Sweeney at Figs. 2, 3, 5, 7, 9-11, and 15.</i></p> <p>Yoakim at [0161]:</p> <p>In yet another embodiment, the surface of the capsule comprises a toothed structure.</p> <p>Yoakim at [0215]:</p> <p>FIG. 23 illustrates another capsule of the invention. The capsule comprises means for connecting it to the external rotational driving means of the device. For this, capsule has a toothed structure 75 on at least one of its outer surface. The capsule has a body 70 comprising an upper edge 72 which can be closed by an upper membrane 71. The toothed structure comprises a series of teeth which is positioned below the edge or rim 72 of the body of the capsule. The teeth are placed along the whole periphery of the body of the capsule. The body of the capsule can be made of plastic and/or aluminium or aluminium alloy. For example, it can be moulded by injection of plastic or deep drawn in aluminium. For example, the shape of the teeth could be slightly triangular, oval, rectangular or pyramidal. It should be noticed that the</p>
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	<p>teeth could be replaced by other equivalent structures such as series of elements in relief and/or hollow. For example, slits, pins or small needles can be envisaged.</p> <p>Yoakim at [0216]:</p> <p>The device itself that receives the capsule of FIG.23 comprises a toothed surface of complementary shape. FIG. 24 shows a capsule holder 44 adapted to receive the capsule of FIG. 23. The capsule holder has a cavity into which are provided hollow teeth 440. The hollow teeth are arranged to fit the teeth 750 on the outer surface of the capsule.</p> <p>Yoakim at FIG. 23:</p>  <p style="text-align: center;">FIG. 23</p>
<p>[1.i] the portion capsule being free of a filter,</p>	<p>The below cited art discloses, either expressly or inherently, the portion capsule being free of a filter. <i>See, e.g.:</i></p>

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Jarisch at [0021]:

In an embodiment, the container comprises a body and a lid connected to the body and wherein the code is present on the lid of the container. The lid may be a closed foil and/or a filter, for example.

Jarisch at FIG. 4:

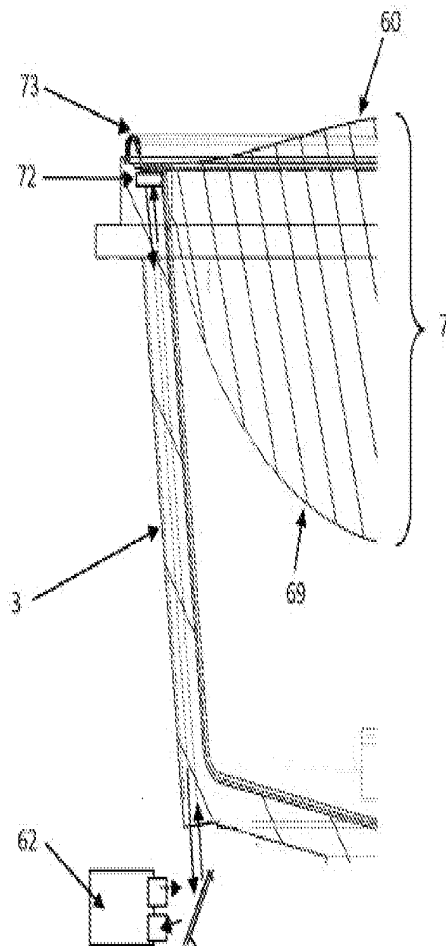


Fig. 4

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	<p>Mahlich at [0004]:</p> <p>The invention concerns single-serving units for the simplified stocking of espresso machines with coffee powder. Increasingly, single-serving capsules or pouches are being used as single-serving units. The pouches enclose a certain amount of pre-portioned coffee powder within a transparent material similar to that of coffee filter paper. Compared to the previously common method of supplying the brewing head of an espresso machine with loose coffee powder, the use of pouches is advantageous due to the fact that the coffee powder contained therein is already pre-pressed, which is important for the generation of crema.</p> <p>Panesar at p. 3 at line 22 – p. 4 at line 2:</p> <p>The insert may be a cartridge. The cartridge may be rigid or semi-rigid. The lower surface may be a laminate. In this case, the inlet and outlet of the cartridge may be portions of the lower surface which are opened for transportation, in use, by piercing the lower surface. Alternatively, the insert may define a receptacle for receiving loose beverage ingredients. Alternatively, the insert may define a receptacle for receiving a container of beverage ingredients, wherein the container comprises filtering means. In one aspect, the container is formed at least in part from filter paper or filtering membrane. For example, the container may be a filter bag.</p> <p>Panesar at p. 9, ll. 9–22:</p> <p>[T]he cartridge 1 generally comprises an outer membrane 2, an inner member 3 and a laminate 5. . . . Other components may optionally be included in the cartridge 1, such as a filter 4 . . .</p> <p>Panesar at p. 41 at line 30 – p. 42 at line 1:</p> <p>The quantity of beverage ingredients loaded into the brewing volume of the insert 400 may be loose or may be contained in a container such as a flexible filter bag made of filter paper.</p> <p>Panesar at p. 42, ll. 18–23:</p>
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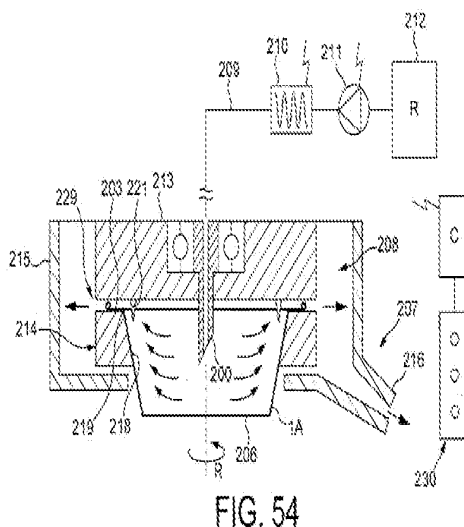
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	<p>The insert 400 has been described particularly for use with beverage ingredients contained in containers such as 20 filter bags. As indicated, the beverage ingredients may alternatively be in a loose form. In this case, a separate filter may be provided in the insert 400 to prevent discharge of beverage ingredient residue.</p> <p>Yoakim at [0171]:</p> <p>In this mode, premade radial outlets for the brewed liquid are provided in the capsule. For instance, a series of slits are provide in the lid and/or body. When the capsule is driven in rotation, the brewed liquid can pass through the slits whereas the solid particles are retained in the capsule. An additional filtering layer can be used to filter the liquid depending on the size of the outlets.</p> <p>Yoakim at [0288]:</p> <p>The capsule may comprise a filter means to filter the centrifuged before the liquid is released from the outlets at the sidewall.</p> <p>Yoakim at [0343]:</p> <p>In a possible mode, the portion of wall with the outlet openings can be formed from a paper filter or woven, non-woven fibres, meshed material, porous polymer membrane or combination thereof. In this case, part of the portion of wall can be formed by a band or different parts of the filter, fibres or meshed material. . . .</p> <p>Yoakim at [0461]:</p> <p>FIGS. 45 to 50 are other variants of capsules according to the invention. For example, the capsule of FIG. 45 has a cylindrical side wall 700, an upper wall 701 and a lower wall 702 both sealed or connected to the sidewall 700. The capsule is gastight by choosing materials for the walls, e.g., aluminium and/or suitable plastics, which have gas barrier properties. The upper walls and lower walls can be flexible or rigid depending on said materials. For example, wall 701 can be a flexible sealing membrane welded on upper rim 703 of the body</p>
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705 forming the sidewall 700 and lower wall 702. The side wall 700 may comprise outlets 704, 706 for release of the liquid when centrifuged in the beverage preparation device around central axis AA of the capsule. Optionally, the capsule may comprise a filter part 708 delimiting the cavity 709 for the substance and a collecting recess 710 peripherally placed relative to the central cavity.

Yoakim at FIG. 54:



[1.j] the base element and/or the lid are made of metal;

The below cited art discloses, either expressly or inherently, the base element and/or the lid are made of metal. *See, e.g.:*

Boyd at [0019]-[0021]:

Although the present invention may be used in virtually any brewing machine, it is described herein for use in the context of machines such as those disclosed in U.S. Pat. No. 5,974,949 to

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	<p>Weber et al. and U.S. Pat. No. 6,035,762 to Ruckstuhl. Those patents disclose machines for brewing espresso using espresso packets in the form of filter capsules which are received through a funnel into a brewing chamber where water is passed through the filter capsule to produce an espresso beverage. The subject matter of each of these patents is incorporated herein by this reference.</p> <p>The invention also may be practiced in connection with espresso machines such as those disclosed in U.S. Pat. Nos. 4,253,385, 4,254,694, 4,353,293, 4,429,623, 4,484, 515, 4,555,894 and 4,852,333, all to Illy. These patents disclose various aspects of espresso machines which include brewing chambers configured to receive pre-fabricated espresso packets through which water is passed to produce an espresso drink. The subject matter of each of these patents also is incorporated herein by this reference.</p> <p>While the aforementioned machines generally are described for use in connection with espresso packets which contain a single serving of espresso, it will be appreciated that the present invention considers application of the relevant principles to machines which employ coffee packets for use in brewing multiple cups, which employ coffee packets of various size and shape, which employ various filter media and which contain coffee of various varieties, roasts, and grinds. Furthermore, the packet and methodology described herein may also produce other types of beverages such as tea, cider, and/or any beverage which is produced by mixing various ingredients. The packet and methodology is not limited to hot beverages and may be used to produce cold beverages.</p> <p><i>See also</i> [1].</p> <p>Jarisch at [0007]:</p> <p>Recognition means can comprise one or more strips of a magnetic material applied to the body of the package, which can be read by an appropriate magnetic sensor, one or more shaped or divided areas of metal foil applied to the package body which cause an inductive effect on movement of the package in the machine, which inductive effect can be sensed; or one or more electrically conductive areas formed on the body of the package which can be sensed electrically.</p>
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	<p>Jarisch at [0093]-[0095]:</p> <p>-Printing on the inner surface of a capsule container, using the curl as information support (Aluminum capsule technology)</p> <p><u>4) Inductive code reading:</u></p> <p>Another mode consists in sensing a code provided on a metallic surface of the capsule using an inductive sensor. The code is formed by reliefs or recesses in the metallic surface.</p> <p>Mahlich at [0005]:</p> <p>The single-serving capsules consist mostly of a deep-drawn plastic or aluminium foil and their advantage, when compared to pouches, lies in the fact that they have an air-tight seal and that certain manufacturers fill them with a protective gas containing the coffee aroma as well. Such pre-proportioned single-serving units are available for approximately 10 different coffee fillings. Due to this variety the consumer is able to stock smaller amounts of different types of coffee. In addition, the use of these single-serving units in conjunction with the special brewing heads of those espresso machines equipped to process such single-serving units results in a reliably constant optimum brew.</p> <p>Yoakim at [0128]:</p> <p>The capsule can comprise a sealing lid. The sealing lid can comprise a flexible membrane. The membrane can comprise gas barrier and support layers made of polymers, aluminium and/or aluminium alloys.</p> <p>Yoakim at [0129]:</p> <p>The capsule can also comprise a cup-shaped body onto which the sealing lid is sealed. The cup-shaped body may also comprise gas barrier materials, such as metal, e.g., thin aluminium and/or plastic.</p>
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	<p>Yoakim at [0215]:</p> <p>The body of the capsule can be made of plastic and/or aluminium or aluminium alloy. For example, it can be moulded by injection of plastic or deep drawn in aluminium.</p> <p>Yoakim at [0461]:</p> <p>FIGS. 45 to 50 are other variants of capsules according to the invention. For example, the capsule of FIG. 45 has a cylindrical side wall 700, an upper wall 701 and a lower wall 702 both sealed or connected to the sidewall 700. The capsule is gastight by choosing materials for the walls, e.g., aluminium and/or suitable plastics, which have gas barrier properties.</p> <p><i>See also</i> [1.c].</p>
[1.k] piercing the foil lid;	<p>The below cited art discloses, either expressly or inherently, piercing the foil lid. <i>See, e.g.:</i></p> <p>Boyd at [0019]-[0021]:</p> <p>Although the present invention may be used in virtually any brewing machine, it is described herein for use in the context of machines such as those disclosed in U.S. Pat. No. 5,974,949 to Weber et al. and U.S. Pat. No. 6,035,762 to Ruckstuhl. Those patents disclose machines for brewing espresso using espresso packets in the form of filter capsules which are received through a funnel into a brewing chamber where water is passed through the filter capsule to produce an espresso beverage. The subject matter of each of these patents is incorporated herein by this reference.</p> <p>The invention also may be practiced in connection with espresso machines such as those disclosed in U.S. Pat. Nos. 4,253,385, 4,254,694, 4,353,293, 4,429,623, 4,484, 515, 4,555,894 and 4,852,333, all to Illy. These patents disclose various aspects of espresso machines which include brewing chambers configured to receive pre-fabricated espresso packets through which water is passed to produce an espresso drink. The subject matter of each of these patents also is incorporated herein by this reference.</p>

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	<p>While the aforementioned machines generally are described for use in connection with espresso packets which contain a single serving of espresso, it will be appreciated that the present invention considers application of the relevant principles to machines which employ coffee packets for use in brewing multiple cups, which employ coffee packets of various size and shape, which employ various filter media and which contain coffee of various varieties, roasts, and grinds. Furthermore, the packet and methodology described herein may also produce other types of beverages such as tea, cider, and/or any beverage which is produced by mixing various ingredients. The packet and methodology is not limited to hot beverages and may be used to produce cold beverages.</p> <p>Jarisch at [0021]:</p> <p>In an embodiment, the container comprises a body and a lid connected to the body and wherein the code is present on the lid of the container. The lid may be a closed foil and/or a filter, for example.</p> <p>Jarisch at [0036]:</p> <p>In the following examples (see FIG. 4), the capsule comprises a cup-shaped body 69 extending by a flange-like rim 73. A lid such as a foil or membrane (liquid-tight or permeable to liquid) 60 is connected to the body, e.g., sealed on the rim. The capsule is filled with beverage ingredient such as ground coffee.</p> <p>Lazaris at [0010]:</p> <p>The holder of the present invention is designed for use in an apparatus for brewing a beverage by infusing heated liquid with a beverage medium contained in a single serve disposable cartridge. In one embodiment of the present invention, the holder is configured for use within a cartridge having an inverted frustum-shaped side wall specially contoured to provide at least one and preferably a plurality of strategically placed surface irregularities. The cartridge is removably received in a cup-shaped housing having a side wall configured and dimensioned to surround the cartridge side wall. Locating elements are arranged to coact with the one or plural surface irregularities in the cartridge side wall to rotatably immobilize the cartridge within the housing. A lid is mounted for manipulation between an open position</p>
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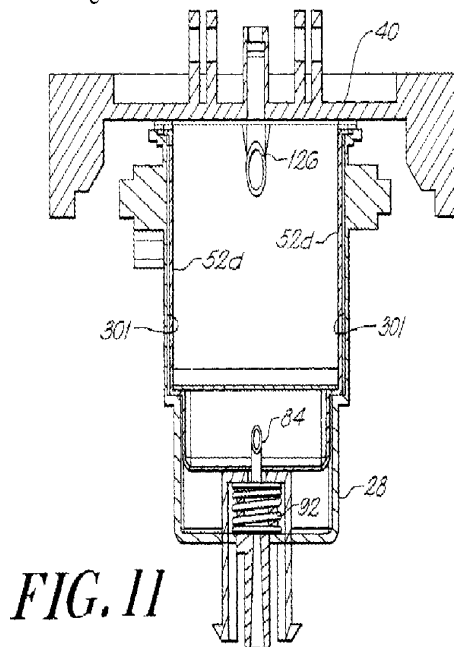
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accommodating insertion and removal of the cartridge, and a closed position confining the cartridge within the housing. Tubular probes associated with the lid and housing are arranged to pierce the thus confined cartridge to thereby accommodate a through flow of heated liquid for infusion with the beverage medium contained in the cartridge.

Lazaris at [0037]:

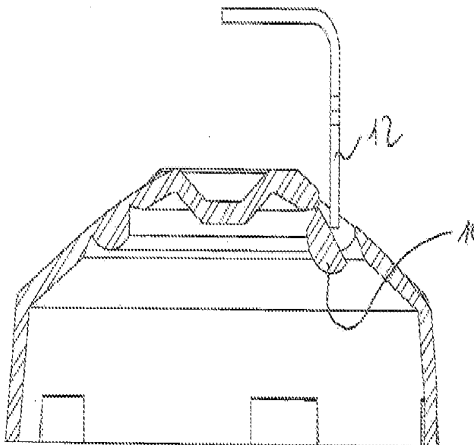
In FIG. 2B, the lid 40 has been lowered, resulting in the cartridge 50 and the cartridge platform 86 being forced downwardly against the action of spring 92. As a result, the cartridge lid and base are pierced respectively by the inlet and outlet probes 126, 84, thus accommodating a flow of heated liquid through the cartridge. The heated liquid infuses a beverage medium (not shown) contained in the cartridge to thereby produce a beverage which exits the cartridge via the outlet probe 84.

Lazaris at Fig. 11:



Mariller at [0020]-[0032]:

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	<p>List of numerical references used in the figures:</p> <ol style="list-style-type: none">1. capsule2. side wall3. top wall4. bottom wall5. cavity6. top wall stiffening element7. side wall stiffening element8. top edge stiffening element9. internal protrusion10. beading11. weakened zone12. piercing element <p>Mariller at Fig. 12:</p> <p>FIG 12</p> 
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	<p>Panesar at p. 3, ll. 22–26:</p> <p>The insert may be a cartridge. . . . The lower surface may be a laminate. In this case, the inlet and outlet of the cartridge may be portions of the lower surface which are opened for transportation, in use, by piercing the lower surface.</p> <p>Panesar at p. 8, ll. 20–26:</p> <p>The beverage preparation machine 201 generally comprises a housing 210 containing a water tank 220, a water heater 225, a water pump 230, an air compressor 235, a control processor, a user interface 240 and a brew head 250. The brew head 250 in turn generally comprises a 25 holder 251, recognition means 252 and inlet and outlet piercers 253, 254.</p> <p>Panesar at p. 9, ll. 9–18:</p> <p>[T]he cartridge 1 generally comprises an outer membrane 2, an inner member 3 and a laminate 5. The outer member 2, inner member 3 and laminate 5 are assembled to form the cartridge 1 which has an interior 120 for containing one or more beverage ingredients, an inlet 121, an outlet 122 and a beverage flow 15 path linking the inlet 121 to the outlet 122 and which passes through the interior 120. The inlet 121 and outlet 122 are initially sealed by the laminate 5 and are opened in use by piercing or cutting of the laminate 5.</p> <p>Panesar at p. 17, ll. 25–29:</p> <p>To use the cartridge 1 it is first inserted into the beverage preparation machine and the inlet 121 and outlet 122 are opened by piercing members of the beverage preparation machine which perforate and fold back the laminate 5.</p> <p>Panesar at p. 29 at line 3 – p. 30 at line 29:</p> <p>The lower part 255 comprises the inlet and outlet piercers 253, 254 and the head 300 of the cartridge recognition means 252. The inlet piercer 253 comprises a hollow needle-like tube 260 having a sharpened end 261 for perforating the laminate 5 of the beverage cartridge 1 in</p>
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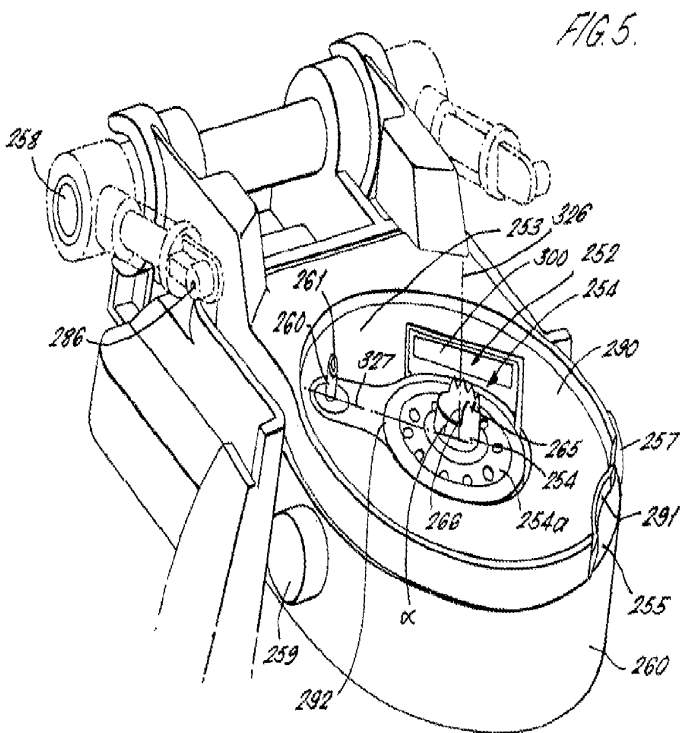
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	<p>use. The inlet piercer 253 is in fluid communication with a water conduit 262 as shown in Figure 7 which passes through the lower part 255 and is connected to an outlet conduit 263 of the water heater 225. The outlet piercer 254 is similar in type to the outlet piercer described in the applicant's European patents EP 0 389 141 and EP 0 334 572 and comprises an open ended cylinder 264 of circular or D-shaped cross-section having dimensions larger than the discharge spout 43. An arcuate portion 265 of the upper end of the outlet piercer 254 is serrated to pierce and eventually cut the laminate of the beverage cartridge 1. The remainder of the upper end is cut back longitudinally of the cylinder at least to the base of the teeth 266 of the serrated portion to fold or pull the cut laminate 5 away from the outlet aperture before the beverage is dispensed there through. The outlet piercer 254 pierces the laminate 5 externally of the discharge spout 43 and when the cartridge mount 257 is in the closed position, rests in the annulus between the discharge spout 43 and the outer wall 42 of the discharge funnel 40. The outlet piercer 254 folds back the cut laminate 105 into the annulus. Thereby both the outlet piercer 254 and the cut laminate 105 are held out of the way of the discharged beverage. The outlet piercer 254 is surrounded by a ledge 254a which is raised relative to its surroundings by 0.5mm. Advantageously, the outlet piercer 254 is removable from the lower part 255 to enable it to be thoroughly cleaned, for example, in a dishwasher. The removable outlet piercer 254 is received in a recess 267 in the lower part 255 where it is seated. The inlet piercer 253 and/or the outlet piercer 254 may be made of a metal, such as stainless steel, or from a plastics material.</p> <p>Panesar at p. 35 at line 32 – p. 33 at line 3:</p>
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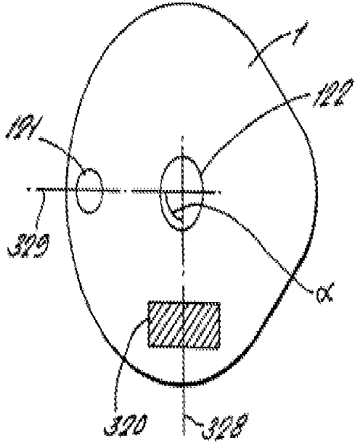
During closure the inlet and outlet piercers 253, 254 pierce the laminate 5 of the cartridge 1 to form the cartridge inlet 121 and outlet 122.

Panesar at FIG. 5:



Panesar at FIG. 10:

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	<p style="text-align: center;"><i>FIG. 10.</i></p>  <p>Sweeney at Abstract:</p> <p>A beverage filter cartridge includes a cup-shaped outer container with a bottom and a side wall extending upwardly from the bottom wall to a circular rim surrounding an upper opening. The side wall has an upper section extending downwardly from the rim to an intermediate section, and a tapered lower section configured to provide a plurality of circumferentially spaced flutes extending downwardly from the intermediate section to the bottom wall. A filter element subdivides the interior of the container into first and second chambers. A beverage medium is stored in the first chamber. A cover is joined to the side wall at the rim to close the upper opening. The cover is yieldably pierceable to accommodate an injection of liquid into the first chamber for combination with the beverage medium to produce a beverage. The filter element is permeable to accommodate a flow of the beverage from the first chamber into the second chamber, and the bottom wall is yieldably pierceable to</p>
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	<p>accommodate an outflow of the beverage from the second chamber to the exterior of the cartridge.</p> <p>Sweeney at 1:19-32:</p> <p>This beverage filter cartridge is comprised basically of an impermeable yieldably-piercable cup-shaped outer container internally subdivided by a permeable cone-shaped filter into first and second chambers. A granular or powdered dry beverage medium, e.g., roasted ground coffee, is stored in the first chamber, and the container is closed by an impermeable yieldably piercable lid.</p> <p>During a processing cycle, the lid and container bottom are pierced, respectively, by tubular inlet and outlet probes. The inlet probe admits heated liquid under pressure into the first chamber for infusion with the beverage medium, and the resulting brewed beverage passes through the filter into the second chamber from which it exits via the outlet probe for delivery to an underlying cup.</p> <p>Sweeney at 4:20-23:</p> <p>The lid may be cut or blanked from any suitable impermeable heat sealable and yieldably piercable material, such as for example, a metallic/polymer laminate supplied by Winpak Heat Seal Packaging, Inc. of Montreal, Canada.</p> <p>Sweeney at 4:35-42:</p> <p>At the onset of a processing cycle, the lid 16 and container bottom 18 are pierced, respectively, by tubular inlet and outlet probes 28, 30 (see FIG. 3). The inlet probe 28 admits a heated liquid, typically hot water, into chamber A where it infuses and combines with the beverage medium M to produce a beverage. The beverage passes through the filter element 14 into chamber B, from which it exits via outlet probe 30.</p> <p>Yoakim at [0186]:</p>
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	<p>At the inside surface of the injection lid 40 is placed a piercing structure 450 which has the function of piercing the injection side 30 of the capsule. A water injector or lance 50 is provided which traverses the injection side 30 and which comprises an injection conduit for carrying water from the water circuit into the capsule. The water injector 50 is preferably located in the center of the capsule.</p> <p>Yoakim at [0187]:</p> <p>A series of needles 51 . . . positioned on the side of the lid 40 to form small perforations at the periphery of the upper side of the capsule.</p> <p>Yoakim at [0435]:</p> <p>About the water injector is mounted a capsule rotary engaging part 149. The engaging part 149 has a central bore for receiving the water injector and rotational guiding means such as a ball or needle bearing 150 inserted between the part 149 and the injector 145. The engaging part further comprises outlet piercing members 151,152, 153, 154 protruding from a disc-shaped engaging wall 155 of the part 149. The piercing members can be small cylindrical portions with a slanted cutting surface able to cut or perforate small holes in the sealing foil 103 of the capsule. The piercing members are arranged at the periphery of the wall 155, preferably evenly distributed to provide several openings in the capsule for the centrifuged liquid to leave the capsule forming several streams of liquid. . .</p>
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Yoakim at FIG. 4:

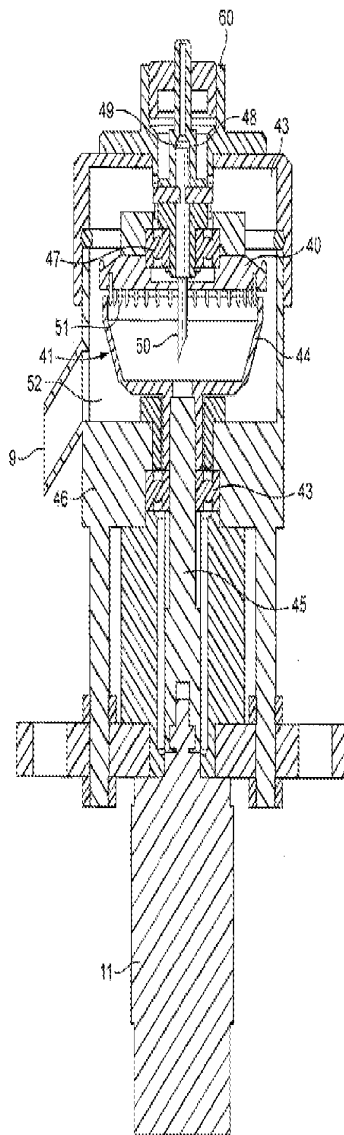


FIG. 4

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Yoakim at FIG. 35:

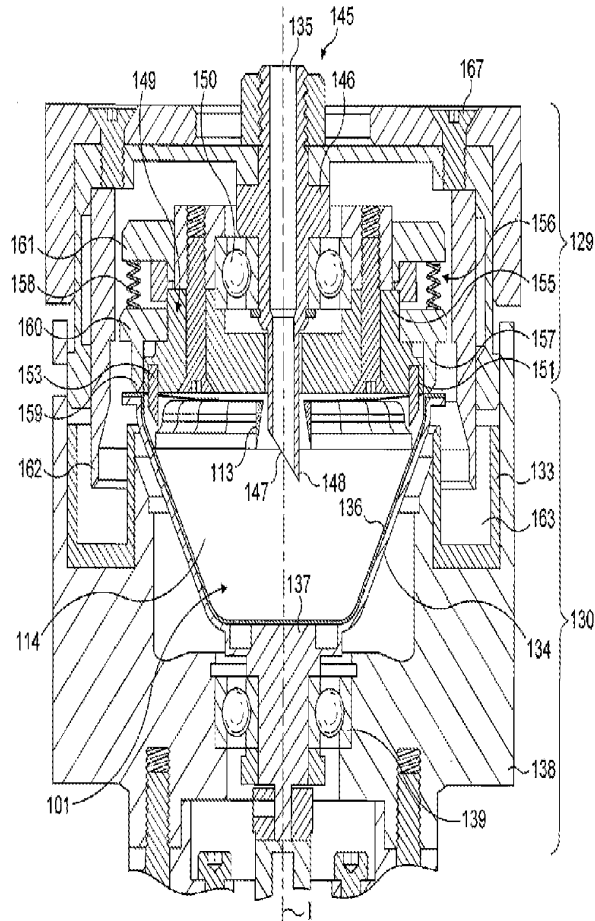


FIG. 35

Yoakim at [0507]:

... The assembly 213 comprises a central injection needle 200 capable of being introduced precisely along the axis of rotation I of the capsule. At its periphery the interface assembly 213 can comprise a series of outlet perforators 221 for allowing centrifuged beverage to leave the

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capsule through the peripheral outlet 229 between the capsule holder 214 and the interface assembly 213. . . .

Yoakim at FIG. 7:

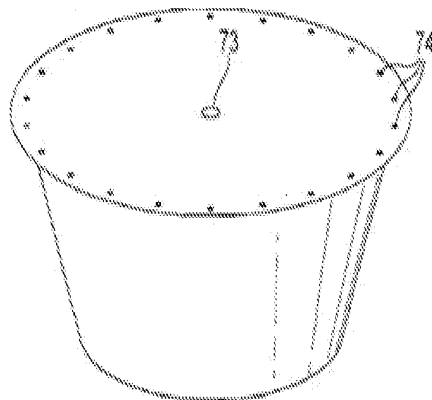


FIG. 7

Yoakim at FIG. 55:

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	<p style="text-align: center;">FIG. 55</p>
<p>[1.1] reading the barcode with the barcode reader;</p>	<p>The below cited art discloses, either expressly or inherently, reading the barcode with the barcode reader. <i>See, e.g.:</i></p> <p>Boyd at [0006]:</p> <p>A brewing packet is provided for use in the preparation of hot or cold beverages. The brewing packet envelops a brewing ingredient chosen according to the tastes of a beverage drinker. The packet includes a machine interpretable feature that contains encoded data capable of being read by a beverage producing device. Furthermore, the data on the packet may be capable of directing the beverage producing device to employ a specific brewing operation suited for the particular brewing packet. This allows for producing the optimal beverage from the brewing ingredient. The packet may be utilized with a variety of brewing ingredients to</p>

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	<p>produce a variety of beverages. Similarly, the packet may be configured to produce single or multiple servings of a beverage.</p> <p>Boyd at [0019]-[0021]:</p> <p>Although the present invention may be used in virtually any brewing machine, it is described herein for use in the context of machines such as those disclosed in U.S. Pat. No. 5,974,949 to Weber et al. and U.S. Pat. No. 6,035,762 to Ruckstuhl. Those patents disclose machines for brewing espresso using espresso packets in the form of filter capsules which are received through a funnel into a brewing chamber where water is passed through the filter capsule to produce an espresso beverage. The subject matter of each of these patents is incorporated herein by this reference.</p> <p>The invention also may be practiced in connection with espresso machines such as those disclosed in U.S. Pat. Nos. 4,253,385, 4,254,694, 4,353,293, 4,429,623, 4,484, 515, 4,555,894 and 4,852,333, all to Illy. These patents disclose various aspects of espresso machines which include brewing chambers configured to receive pre-fabricated espresso packets through which water is passed to produce an espresso drink. The subject matter of each of these patents also is incorporated herein by this reference.</p> <p>While the aforementioned machines generally are described for use in connection with espresso packets which contain a single serving of espresso, it will be appreciated that the present invention considers application of the relevant principles to machines which employ coffee packets for use in brewing multiple cups, which employ coffee packets of various size and shape, which employ various filter media and which contain coffee of various varieties, roasts, and grinds. Furthermore, the packet and methodology described herein may also produce other types of beverages such as tea, cider, and/or any beverage which is produced by mixing various ingredients. The packet and methodology is not limited to hot beverages and may be used to produce cold beverages.</p> <p>Boyd at [0023]:</p> <p>With the foregoing in mind, it will be appreciated that it would be desirable to automatically customize the brew operation based on particular characteristics of the packet, the</p>
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	<p>characteristics of the coffee, and/or the tastes of the user, whether or not the user is aware of what changes in the brew operation will lead to the desired taste. The present invention provides a vehicle for such customization in the form of an encoded packet configured to provide the brewing machine with data useful in directing the brewing operation in accordance with packet or packet content characteristics and/or the user's tastes.</p> <p>Boyd at [0028]:</p> <p>As shown in FIG. 2, packet 10 includes a machine interpretable feature 30 which directs operation of the coffee machine in accordance with predefined brewing directives. In the first depicted embodiment, the machine interpretable feature is a barcode 31 as depicted in FIG. 2 and 2a. It will be understood that the machine interpretable feature may be any machine readable feature associated with packet 10.</p> <p>Boyd at [0030]:</p> <p>Machine interpretable feature 30, it will be appreciated, is capable of storing a significant amount of data, including specific brewing directives and/or packaging or ingredient characteristics. Examples of the types of brewing directives stored in machine interpretable feature 30 may include, for example, contact time, contact pattern, fluid volume, fluid temperature, fluid pressure, and/or fluid pass-through rate. The above brewing directives are all well known in the coffee brewing industry to affect the taste and quality of the coffee beverage. Examples of ingredient characteristics which may be stored in machine interpretable feature 30 include grind, blend, roast, quantity, bed depth, freshness, and expiration date. These examples are meant to be exemplary, not limiting in scope.</p> <p>Boyd at [0032]-[0034]:</p> <p>Coffee machine 100 includes a sensor 130 designed to read machine interpretable feature 30 of packet 10. Sensor 130 is in turn operatively connected to a processor 140 which controls coffee machine 100. Machine interpretable feature 30 may store data which is read by sensor 130 and passed to processor 140. Processor 140 may then direct the brewing operation in accordance with its interpretation of the data derived from machine interpretable feature 30. For example, processor 140 may direct coffee machine 100 to brew using a pre-selected</p>
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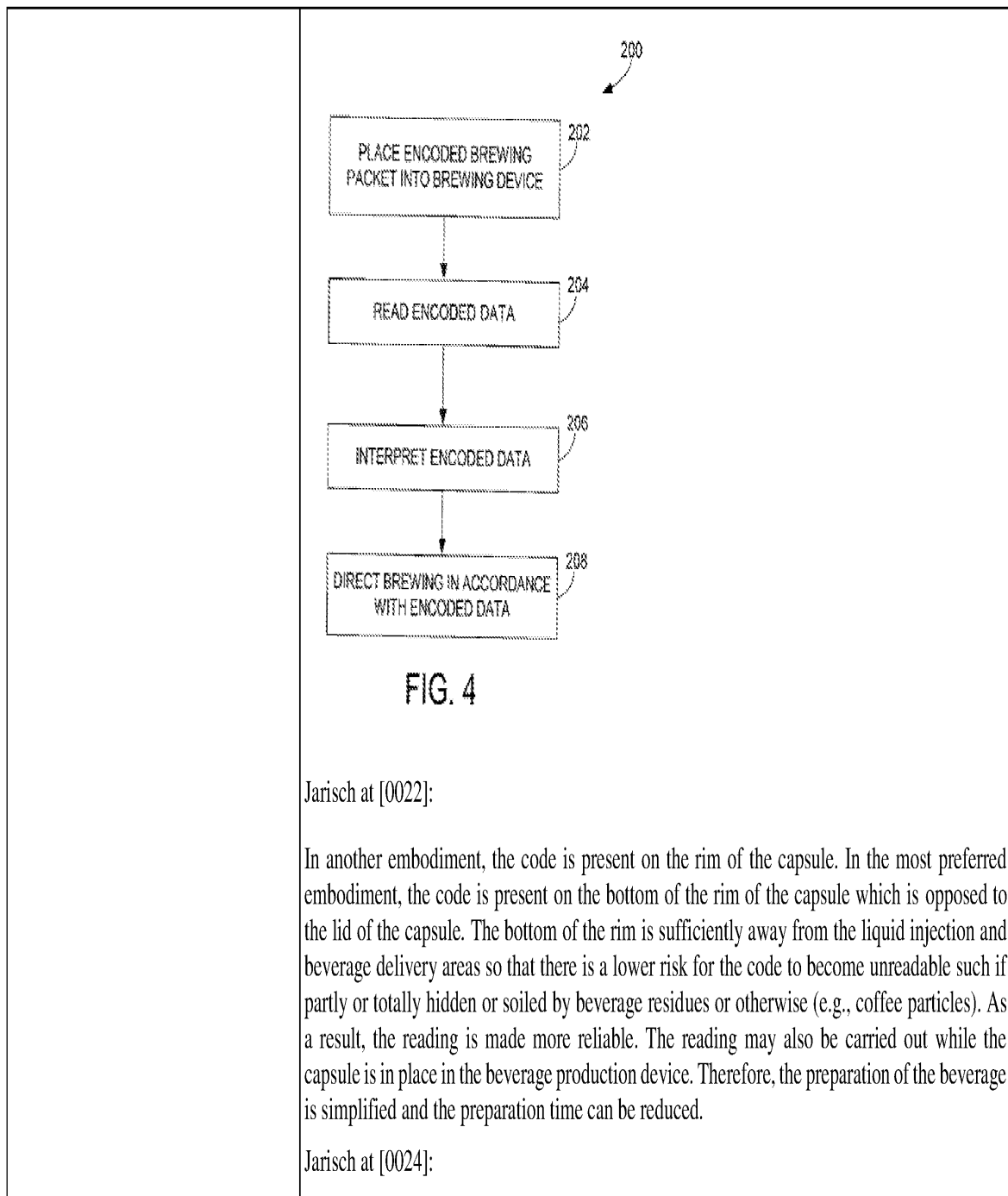
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	<p>contact time, contact pattern, fluid quantity, fluid temperature, fluid pressure, and/or fluid pass-through rate expressed in machine interpretable feature 30. Alternatively, the processor may itself make determinations of contact time, contact pattern, fluid quantity, fluid temperature, fluid pressure, and/or fluid pass-through rate based on information contained in machine interpretable feature 30. The processor may also, based on information contained in machine interpretable feature 30, direct the coffee machine to add water, milk, cream, sugar, or any suitable condiment to the coffee beverage.</p> <p>As alluded to above, machine interpretable feature 30 need not store data specifically including brewing directives and ingredient characteristics. Instead machine interpretable feature 30 may act as an identifier so that brewing directives and ingredient characteristics may be looked up from data storage 150 within (or external to) coffee machine 100. Sensor 130 thus may read machine interpretable feature 30 and processor 140 may match the machine interpretable feature with predefined brewing operation instructions stored in such memory. Processor 140 may then direct the brewing operation based on brewing operation instructions. In one embodiment, the brewing operation instructions are matched to a machine interpretable feature using a look-up table in which brewing operation instructions correspond in a one-to-one ratio with each known ingredient variety, packet size, packet construction, user preference, etc. It will be appreciated, however, that other arrangements for matching machine interpretable feature 30 with brewing directives similarly may be used.</p> <p>Referring now to FIG. 4, a method of operation for the present invention is illustrated at 200. At 202, a brewing packet encoded with packet-characteristic data is placed into a brewing device. At 204, the packet-characteristic data is read by a sensor. At 206, the packet-characteristic data is interpreted by a processor. Finally, at 208, brewing is directed in accordance with the packet-characteristic data read by the sensor and interpreted by the processor.</p>
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	<p>Boyd at Fig. 3:</p> <p>FIG.3</p> <p>Boyd at Fig. 4:</p>
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	<p>In particular the reading means may comprise a light emitter and a light sensor. In an alternative, the reading means comprises an inductive sensor. The optical reading means or inductive sensor may be arranged to detect a code on the rim of the capsule.</p> <p>Jarisch at [0064]-0064]:</p> <p><u>2) Optical reading on rim bottom side of capsule (figures 4 to 7):</u></p> <p>The capsule 7 may comprise a code 70 on the bottom side 72 of its rim 73. The bit code is formed of a succession of small rectangular surfaces having light mirroring properties and intermediate surfaces having flat mirroring and/or diffusing properties.</p> <p>Jarisch at [0070]:</p> <p>The bit code is read by rotating the capsule along its central axis A.</p> <p>Lazaris at [0042]:</p> <p>It is contemplated that the housings may be mounted such that they do not pivot to automatically eject the cartridges at the end of the brewing cycle, thus requiring users to manually remove the used cartridges. The holder may also employ multiple inlet probes to increase liquid distribution within the cartridge. The inlet probes also may have different heights to improve saturation of the beverage medium within the cartridge. It is also contemplated that the brewer may include a control system for automatically determining the type of cartridge (e.g., the beverage medium within the cartridge) and adjust the brewing cycle accordingly. This may include providing machine readable data such as bar codes, data matrixes, dielectric encoding, etc, on a portion of the cartridge exterior accessible to a corresponding reader in the brewer.</p> <p>Mahlich at [0008]:</p> <p>It is thus the task of the present invention to equip the actual single-serving units to be selected with suitable machine readable identification whereby complicated voluminous double mirror scanners are not required for reading the identification code and whereby the accurate alignment of the single-serving pouch with regard to the scanner or its reading unit does not matter. In particular, the difficult process of aligning a rotation-symmetrical single-</p>
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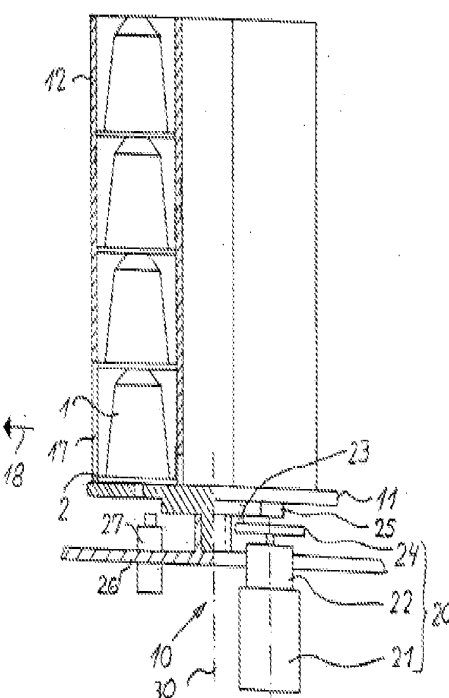
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	<p>serving unit, whereby the shape of the capsule is mainly frustoconical and the pouch is mainly lozenge-shaped, is thus eliminated.</p> <p>Mahlich at [0010]:</p> <p>According to the invention, direct scanning or immediate reading of the identification on the single-serving unit, particularly of the single-serving capsule itself and not of any part of the storage magazine adjacent to the capsule, guarantees that the selected type of coffee is correctly identified with the single-serving unit and is actually being brewed after removal of the single-serving unit from the storage magazine. The identification can be read easily and accurately via an uncomplicated and compact reading head able to read in a linear manner, provided that the reading head is able to register the rotation-symmetrical identification. However, the rotational or angular position of the rotation-symmetrical identification with regard to the reading head that reads in a linear manner is not important, whereby the alignment of the single-serving unit with regard to the reading head is greatly simplified. In addition, the rotation-symmetrical identification is suitable for testing via a simple procedure according to claim 12.</p> <p>Mahlich at [0014]-[0016]:</p> <p>Apart from coffee type identification, the identification on any single-serving unit may also contain producer identification, whereby the latter in conjunction with an adapted evaluation system for controlling the espresso machine can block operation of the espresso machine if the producer identification on the single-serving unit does not correspond to the machine's preprogrammed producer identification.</p> <p>As mentioned above, an uncomplicated system for the registration of the machine readable identification on a single-serving unit according to the invention may consist of a registration device with at least one reading head able to read in a linear manner. The reading head comprises a reading sensor consisting of a transmitter scanning a luminous spot on the identification or part thereof, and of a decoder receiver. The latter may be equipped with a controlling device whereby the setting, particularly that of a magazine unit, can be controlled</p>
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	<p>in order to convey the single-serving units containing the desired coffee type into the dispensing position.</p> <p>According to claim 7 the linear reading head is located in a compact and secure position below the magazine tubes of the magazine unit. The reading head is directed upwards towards the plane where the bases of the single-serving capsules are positioned within the magazine tubes, in such a way that the rotation-symmetrical identification on the base of the respective lowest single-serving capsule can be read.</p> <p>Mahlich at [0037]</p> <p>The support frame 26 also carries a reading head 27 mainly consisting of a scan transmitter and an encoder receiver. Reading head 27 is pointing from below towards the turntable 11 in such a way that it is able to register and scan the single-serving capsules stacked with their base facing downwards inside the magazine tubes 12 to 16 when the magazine tubes are moved across the reading head 27.</p> <p>For this purpose at least part of turntable 11 is transparent to the scanning of the ID code: windows 29 located below the magazine tubes 12 to 16 are designed as slits and are each arranged at equal radial distance to a main axis 30 of turntable 11, cf. FIG. 3. The ID codes 3 on the bases 2 of the single-serving capsules can be registered across their greatest radius r_1 and r_2 through these slits, according to FIG. 1a. In this case ID code 3 is being registered on entering and on leaving the reading station when the base 2 of the capsule, equipped with the ID code, passes on its circular path across reading head 27 arranged in front of dispensing station 18 in the direction of rotation 28 of the turntable. It is thus guaranteed, via comparison of the two registered ID codes as well as via data processing, that only one single-serving capsule 1 containing the desired coffee type is conveyed to the dispensing station 18, once the desired coffee type has been selected, for example by means of a control panel or a knob.</p> <p>Mahlich at Fig. 3:</p>
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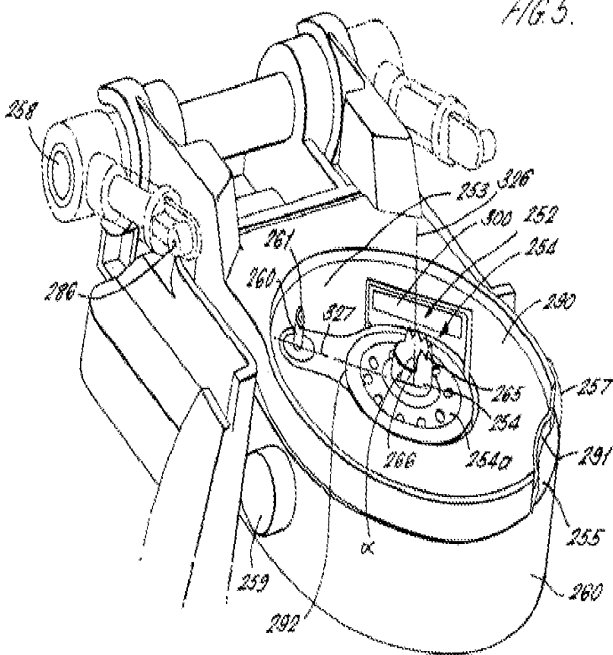
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	<p style="text-align: center;">Schnitt A-B Fig. 3</p>  <p>See also Mahlich at Claims 1-12.</p> <p>Panesar at p. 4, ll. 24-29:</p> <p>The beverage preparation machine may comprise a brew head comprising an upwardly directed inlet for supplying water to the brew head, a downwardly directed outlet for outflow of beverage produced by the machine and a barcode or RFID reader having a window in the brew head through which signals may be transmitted . . .</p> <p>Panesar at p. 5, ll. 7-8:</p>
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	<p>Preferably the barcode reader or RFID reader window is located at or near a periphery of the brew head.</p> <p>Panesar at p. 34, ll. 5–26:</p> <p>The purpose of the recognition means 252 is to allow the machine 201 to recognize the type of beverage cartridge 1 that has been inserted and to adjust one or more operational parameters accordingly. In a typical embodiment, the recognition means 252 comprises an optical barcode reader which reads the printed barcode 320 provided on the laminate 5 of the beverage cartridge 1 as shown in Figure 10 and discussed above. The optical barcode reader comprises one or more LEDs 321 to illuminate the barcode 320, a focusing lens 322 to acquire an image of the barcode, a charge coupled device (CCD) 323 for producing an electrical signal representative of the acquired image and support circuitry for the LEDs and CCD. The space in the lower part for accommodating the barcode reader is limited. A mirror or mirrors 324 may be used to reflect the light from the LEDs 321 to a focusing lens which is not located in the lower part 255. Schematic arrangements are shown in Figures 9a and 9b. The lower part 255 comprises an aperture 326 which is the same size as the barcode 320 on the beverage cartridge 1. The aperture 326 is closed by a window, preferably glass, which can transmit the signals produced by the barcode reader.</p> <p>Panesar at p. 35, ll. 4–6:</p> <p>Alternatively, an RFID reader is provided to read an RFID located on the cartridge 1.</p> <p>Panesar at FIG. 5:</p>
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	<p style="text-align: right;"><i>FIG. 5.</i></p>  <p>Panesar at Claims 24, 27, 30.</p> <p>Rossi at Abstract:</p> <p>The process for controlling the operation of an edible-product making machine (1) of the type being fed with a single use load element (2) having a brewable or water soluble aromatic substance (3) for preparation of the edible product, comprises a first step of recognition wherein the edible-product making machine (1) recognises an identifying element (4) on the load element (2) allowing the edible-product making machine (1) to take further steps only if it also recognises on the load element (2) a validation element (5) to be validated, a second step of validation of the validation element (5), and a third step of activation wherein the edible-product making machine (1) automatically activates a cycle of production of the edible product only after having recognised on the load element (2) the identifying element (4) in combination with the validation element (5) as validated.</p>
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Rossi at Fig. 1:

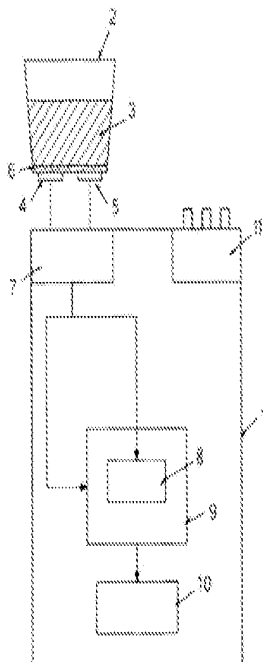


FIG 1

Rossi at 4:

The technical task, as well as these and other objects, are achieved according to the present invention by a process for controlling the operation of an edible-product making machine of the type being fed with a single use load element having a brewable or water soluble aromatic substance for preparation of said edible product, characterised in that it comprises a first step of recognition wherein said edible-product making machine recognises an identifying element on said load element allowing said edible-product making machine to take further steps only if it also recognises on said load element a validation element to be validated, a second step of validation of said validation element, and a third step of activation wherein said edible-product making machine automatically activates a cycle of production of said edible product

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	<p>only after having recognised on said load element said identifying element in combination with said validation element as validated.</p> <p>Rossi at 6:</p> <p>The process of the present invention comprises a first step of the edible-product making machine recognising an identifying element on the load element. This can optionally be through an infra red (IR) wave communication channel, a radio frequency (RF) wave communication channel, or an optical wave communication channel. The user may hold the identifying element on the load element up against recognition means located externally on the edible-product making machine.</p> <p>Rossi at 9:</p> <p>The load element of the system comprises an identifying element for its recognition and a validation element for its validation. These are preferably in the form of barcodes, antennae, or paints having optically measurable properties. The machine comprises means for recognising the load element and the validation element, such as at least one infra red barcode reader, radio frequency wave transmitter and receiver, or optical sensor. These are preferably located externally on a lateral wall of the capsule, externally on the protective packaging of the capsule, or externally on the protective sheet on the outlet base of the capsule.</p> <p>Rossi at 10:</p> <p>Figure 1 shows a schematic view of one embodiment of the system of the present invention.</p> <p>With reference to the above figure, the system comprises an edible-product making machine 1 and a single use load element in the form of a capsule 2. The load element contains a brewable or water soluble aromatic substance 3 for preparation of an edible product. The capsule 2 comprises an identifying element in the form of a barcode 4 and a validation element also in the form of a barcode 5, both located externally on a protective sheet 6 of the outlet base of the capsule. The machine 1 comprises recognising means in the form of an infrared barcode reader 7. This is connected to checking means 8 stored within a control unit 9 of the machine. The checking means allow the machine activation means 10 to be engaged</p>
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	<p>only if the barcode reader 7 recognises the identification barcode 4 and the validation barcode 5. The machine 1 further comprises validation means in the form of a mechanical tool 11 having a plurality of tips for destroying the validation barcode 5, for example by ripping, cutting, scratching or piercing, such that the barcode reader 7 cannot recognise it as an unvalidated validation barcode. If, after the positive signal from the checking means 8 from the first recognition of the identification and validation barcodes 4,5, the barcode reader 7 performs a second recognition of the identification barcode 4 combined with the validated validation barcode 5, the activation means 10, connected to the barcode reader 7 through the control unit 9, automatically activate a cycle of production of the edible product. Rossi at Claim 15.</p> <p>Yoakim at [0025]:</p> <p>The device is useful for preparing beverages from a plurality of different capsules, in which case it further comprises identification means for identifying the different capsules, and control means capable of operating the device in centrifugation for any of the different capsules according to predetermined liquid food preparation parameters including the flow rate and the volume of liquid to be injected into the capsule, with the identification means comprising capsule recognition means which are recognized by sensing means connected to the control means of the device to control the preparation parameters accordingly.</p> <p>Yoakim at [0192]:</p> <p>Therefore, as much as two, three, four or even more different flow rates and/or speed ranges can be provided in function of the types of coffee to be delivered. Therefore, depending on the types of beverage to be brewed, the control unit can be programmed to adjust the optical centrifugal conditions. For instance, the control unit may be associated to a capsule recognition system enabling to recognize the types of capsules, i.e., espresso, lungo, cappuccino, long coffee (e.g., 180-400 ml), latte, tea, etc., and to adjust the speed and/or other brewing parameters (e.g., water temperature) according the capsule which is inserted in the device. A recognition system uses a code on the capsule and recognized by the device, such as a color, a barcode, an RFID, a magnetic code, ferromagnetic micro-wires or labels, shapes and combinations thereof.</p>
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	<p>Yoakim at [0477]:</p> <p>The capsule system further comprises an identification means associated to the different capsules in the set for identifying each capsule and adjusting brewing parameters accordingly.</p> <p>Yoakim at [0496]:</p> <p>The recognition means can be differentiable by a visual code such as a barcode, a colour, a sign, a logo, etc., or by a radio-frequency code (RFID), a magnetic element or by an identifiable shape.</p> <p>Yoakim at [0477]:</p> <p>The capsule system further comprises an identification means associated to the different capsules in the set for identifying each capsule and adjusting brewing parameters accordingly. The adjustable parameters can be the rotational speed, the back-pressure at the outlet of the capsule, and/or the volume of liquid fed in the capsule. The identification means participates to deliver a wider range of beverages having differentiated characteristics (volume, taste, strength, crema, colour, etc.). The identification means are associated to control means placed in the centrifugal brewing device which controls the adjustment of the said parameters, by controlling the rotational motor driving the capsule holder or/and the pump supplying liquid in the capsule.</p> <p>Yoakim at [0494]-[0496]:</p> <p>The identification means can be sensed by sensing means connected to the control means for an active control of the parameters or can be passive identification means, e.g., selective flow restriction means. In particular, the identification means comprises capsule recognition means which are recognized by the sensing means connected to the control means of the brewing device which controls the brewing parameters accordingly. The recognition means can be differentiable by a visual code such as a barcode, a colour, a sign, a logo, etc., or by a radio-frequency (RFID), a magnetic element or by an identifiable shape.</p>
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	<p>Yoakim at [0525]:</p> <p>In an alternative illustrated in FIGS. 61 and 62, the identification means are directly associated to the different capsules. In this case, the identification means ID4 and ID5 are capsule recognition means attached to or embedded in the capsules. The recognition means can be any mechanical, optical, magnetic, or radio-frequency recognition means capable of delivering information to the brewing device, via a sensing device 231, as to which type of capsule is inserted in the device. For example, the recognition means is a barcode, a colour code, a RFID tag, a magnetically sensitive element, or a mechanical key or shape.</p>
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	<p>Yoakim at FIG. 61:</p> <p>FIG. 61</p> <p>See also [1.a] and [1.e].</p>
<p>[1.m] determining whether the read barcode agrees with a stored reference; and activating the pump to push heated water into the portion capsule only upon a determination</p>	<p>The below cited art discloses, either expressly or inherently, determining whether the read barcode agrees with a stored reference; and activating the pump to push heated water into the portion capsule only upon a determination that the read barcode agrees with the stored reference. <i>See, e.g.:</i></p> <p>Boyd at [0006]:</p>

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that the read barcode agrees with the stored reference.	<p>A brewing packet is provided for use in the preparation of hot or cold beverages. The brewing packet envelops a brewing ingredient chosen according to the tastes of a beverage drinker. The packet includes a machine interpretable feature that contains encoded data capable of being read by a beverage producing device. Furthermore, the data on the packet may be capable of directing the beverage producing device to employ a specific brewing operation suited for the particular brewing packet. This allows for producing the optimal beverage from the brewing ingredient. The packet may be utilized with a variety of brewing ingredients to produce a variety of beverages. Similarly, the packet may be configured to produce single or multiple servings of a beverage.</p> <p>Boyd at [0019]-[0021]:</p> <p>Although the present invention may be used in virtually any brewing machine, it is described herein for use in the context of machines such as those disclosed in U.S. Pat. No. 5,974,949 to Weber et al. and U.S. Pat. No. 6,035,762 to Ruckstuhl. Those patents disclose machines for brewing espresso using espresso packets in the form of filter capsules which are received through a funnel into a brewing chamber where water is passed through the filter capsule to produce an espresso beverage. The subject matter of each of these patents is incorporated herein by this reference.</p> <p>The invention also may be practiced in connection with espresso machines such as those disclosed in U.S. Pat. Nos. 4,253,385, 4,254,694, 4,353,293, 4,429,623, 4,484, 515, 4,555,894 and 4,852,333, all to Illy. These patents disclose various aspects of espresso machines which include brewing chambers configured to receive pre-fabricated espresso packets through which water is passed to produce an espresso drink. The subject matter of each of these patents also is incorporated herein by this reference.</p> <p>While the aforementioned machines generally are described for use in connection with espresso packets which contain a single serving of espresso, it will be appreciated that the present invention considers application of the relevant principles to machines which employ coffee packets for use in brewing multiple cups, which employ coffee packets of various size and shape, which employ various filter media and which contain coffee of various varieties, roasts, and grinds. Furthermore, the packet and methodology described herein may also produce other types of beverages such as tea, cider, and/or any beverage which is produced by</p>
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	<p>mixing various ingredients. The packet and methodology is not limited to hot beverages and may be used to produce cold beverages.</p> <p>Boyd at [0023]:</p> <p>With the foregoing in mind, it will be appreciated that it would be desirable to automatically customize the brew operation based on particular characteristics of the packet, the characteristics of the coffee, and/or the tastes of the user, whether or not the user is aware of what changes in the brew operation will lead to the desired taste. The present invention provides a vehicle for such customization in the form of an encoded packet configured to provide the brewing machine with data useful in directing the brewing operation in accordance with packet or packet content characteristics and/or the user's tastes.</p> <p>Boyd at [0028]:</p> <p>As shown in FIG. 2, packet 10 includes a machine interpretable feature 30 which directs operation of the coffee machine in accordance with predefined brewing directives. In the first depicted embodiment, the machine interpretable feature is a barcode 31 as depicted in FIG. 2 and 2a. It will be understood that the machine interpretable feature may be any machine readable feature associated with packet 10.</p> <p>Boyd at [0030]:</p> <p>Machine interpretable feature 30, it will be appreciated, is capable of storing a significant amount of data, including specific brewing directives and/or packaging or ingredient characteristics. Examples of the types of brewing directives stored in machine interpretable feature 30 may include, for example, contact time, contact pattern, fluid volume, fluid temperature, fluid pressure, and/or fluid pass-through rate. The above brewing directives are all well known in the coffee brewing industry to affect the taste and quality of the coffee beverage. Examples of ingredient characteristics which may be stored in machine interpretable feature 30 include grind, blend, roast, quantity, bed depth, freshness, and expiration date. These examples are meant to be exemplary, not limiting in scope.</p>
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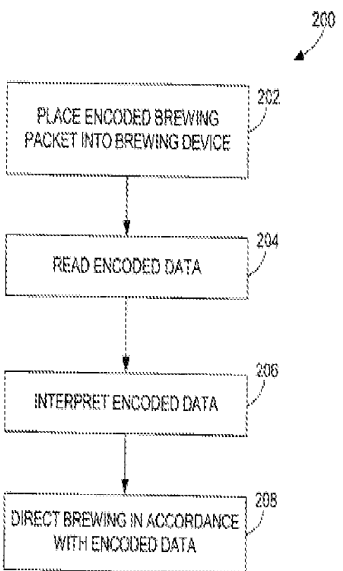
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	<p>Boyd at [0032]-[0037]:</p> <p>Coffee machine 100 includes a sensor 130 designed to read machine interpretable feature 30 of packet 10. Sensor 130 is in turn operatively connected to a processor 140 which controls coffee machine 100. Machine interpretable feature 30 may store data which is read by sensor 130 and passed to processor 140. Processor 140 may then direct the brewing operation in accordance with its interpretation of the data derived from machine interpretable feature 30. For example, processor 140 may direct coffee machine 100 to brew using a pre-selected contact time, contact pattern, fluid quantity, fluid temperature, fluid pressure, and/or fluid pass-through rate expressed in machine interpretable feature 30. Alternatively, the processor may itself make determinations of contact time, contact pattern, fluid quantity, fluid temperature, fluid pressure, and/or fluid pass-through rate based on information contained in machine interpretable feature 30. The processor may also, based on information contained in machine interpretable feature 30, direct the coffee machine to add water, milk, cream, sugar, or any suitable condiment to the coffee beverage.</p> <p>As alluded to above, machine interpretable feature 30 need not store data specifically including brewing directives and ingredient characteristics. Instead machine interpretable feature 30 may act as an identifier so that brewing directives and ingredient characteristics may be looked up from data storage 150 within (or external to) coffee machine 100. Sensor 130 thus may read machine interpretable feature 30 and processor 140 may match the machine interpretable feature with predefined brewing operation instructions stored in such memory. Processor 140 may then direct the brewing operation based on brewing operation instructions. In one embodiment, the brewing operation instructions are matched to a machine interpretable feature using a look-up table in which brewing operation instructions correspond in a one-to-one ratio with each known ingredient variety, packet size, packet construction, user preference, etc. It will be appreciated, however, that other arrangements for matching machine interpretable feature 30 with brewing directives similarly may be used.</p> <p>Referring now to FIG. 4, a method of operation for the present invention is illustrated at 200. At 202, a brewing packet encoded with packet-characteristic data is placed into a brewing device. At 204, the packet-characteristic data is read by a sensor. At 206, the packet-characteristic data is interpreted by a processor. Finally, at 208, brewing is directed in</p>
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	<p>accordance with the packet-characteristic data read by the sensor and interpreted by the processor.</p> <p>Because the processor may be employed to effect the aforementioned predefined brewing directives based on the machine interpretable feature associated with each packet. The brewing operation may be made consistent based on consistent machine interpretable features from packet to packet. Similarly, the brewing operation may be altered in accordance with desired brewing characteristics each time the packet is replaced. Particular brew characteristics thus may be controlled simply by selection of a packet with the desired encoded brewing directives (whether or not such directives are known to the coffee machine operator). Control of the brewing process thus may be handed off to the brewing professionals who produce the packets, rather than relying on untrained machine operators. This may be done without sacrificing variety in brew operation based on differing characteristics of the packet contents or consumer tastes.</p> <p>For example, a person desiring weaker coffee may purchase packets designated such in order to direct the machine to add water to the brewed coffee beverage in accordance with proper brewing procedure. This avoids problems associated with ill-advised attempts to dilute coffee by decreasing the quantity of coffee used, a change which may result in a corresponding change in bed depth, and thus in an undesirable change in coffee taste.</p> <p>The encoded packets also may be used to track brewing information which may be useful in ensuring satisfaction with the brewed coffee beverage. For example, the packet may include an encoded date for use in tracking freshness of the coffee grounds contained within the packet. Upon determining that the packet is stale, the processor may direct the machine to note such staleness, thus avoiding an unsatisfactory beverage. Similarly, the packet may contain encoded data related to the coffee blend contained within the packet, such data being stored in memory to provide a history of coffee blends. The encoded packet also may contain encoded data defining the source of the packet so as to prohibit use of counterfeit packets, or packets from unauthorized suppliers.</p>
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	<p>Boyd at Fig. 4:</p>  <pre> graph TD 200 --> 202[PLACE ENCODED BREWING PACKET INTO BREWING DEVICE] 202 --> 204[READ ENCODED DATA] 204 --> 206[INTERPRET ENCODED DATA] 206 --> 208[DIRECT BREWING IN ACCORDANCE WITH ENCODED DATA] </pre> <p>FIG. 4</p> <p>Jarisch at [0023]:</p> <p>The invention further relates to a system for preparing a beverage from a capsule as aforementioned and further comprising a beverage preparation device; wherein the device comprises capsule holding means for holding the capsule and rotational drive means for driving the holding means and capsule in rotation along said axis of rotation and reading means arranged for reading the code when the capsule is rotated along said axis.</p> <p>Jarisch at [0024]:</p> <p>In particular, the reading means may comprise a light emitter and a light sensor. In an alternative, the reading means comprises an inductive sensor. The optical reading means or inductive sensor may be arranged to detect a code on the rim of the capsule.</p>
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	<p>Jarisch at [0071]-[0073]:</p> <p>The reader may consist of:</p> <ul style="list-style-type: none"> • A light source with/without focusing optic, and • A light sensor with/without focusing optic. <p>Jarisch at [0082]:</p> <p>In the embodiment of the figure 4, the light source is placed at the bottom of the centrifugal cell 3. This cell is light conductive allowing the beam to reach the bottom side 72 of its rim 73. The reflected light is conducted by the transparent (or light conductive) centrifugal cell 3 to reach the sensor 62. In case that the sensor 62 cannot be aligned with the transparent part of the centrifugal cell 3, a mirror can be placed as illustrated in the figure 4 to deflect the forward and backward beams.</p> <p><i>See also</i> Jarisch at Claims 14-16; FIGs. 2-7.</p> <p>Mahlich at [0008]:</p> <p>It is thus the task of the present invention to equip the actual single-serving units to be selected with suitable machine readable identification whereby complicated voluminous double mirror scanners are not required for reading the identification code and whereby the accurate alignment of the single-serving pouch with regard to the scanner or its reading unit does not matter. In particular, the difficult process of aligning a rotation-symmetrical single-serving unit, whereby the shape of the capsule is mainly frustoconical and the pouch is mainly lozenge-shaped, is thus eliminated.</p> <p>Mahlich at [0010]:</p> <p>According to the invention, direct scanning or immediate reading of the identification on the single-serving unit, particularly of the single-serving capsule itself and not of any part of the storage magazine adjacent to the capsule, guarantees that the selected type of coffee is correctly identified with the single-serving unit and is actually being brewed after removal of the single-serving unit from the storage magazine. The identification can be read easily and</p>
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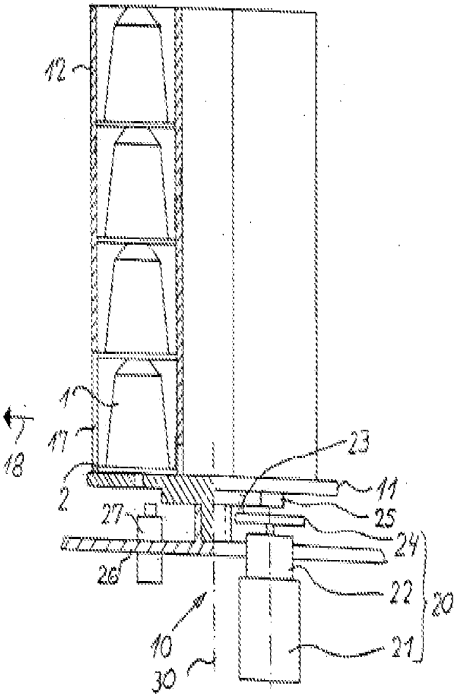
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	<p>accurately via an uncomplicated and compact reading head able to read in a linear manner, provided that the reading head is able to register the rotation-symmetrical identification. However, the rotational or angular position of the rotation-symmetrical identification with regard to the reading head that reads in a linear manner is not important, whereby the alignment of the single-serving unit with regard to the reading head is greatly simplified. In addition, the rotation-symmetrical identification is suitable for testing via a simple procedure according to claim 12.</p> <p>Mahlich at [0014]-[0016]:</p> <p>Apart from coffee type identification, the identification on any single-serving unit may also contain producer identification, whereby the latter in conjunction with an adapted evaluation system for controlling the espresso machine can block operation of the espresso machine if the producer identification on the single-serving unit does not correspond to the machine's preprogrammed producer identification.</p> <p>As mentioned above, an uncomplicated system for the registration of the machine readable identification on a single-serving unit according to the invention may consist of a registration device with at least one reading head able to read in a linear manner. The reading head comprises a reading sensor consisting of a transmitter scanning a luminous spot on the identification or part thereof, and of a decoder receiver. The latter may be equipped with a controlling device whereby the setting, particularly that of a magazine unit, can be controlled in order to convey the single-serving units containing the desired coffee type into the dispensing position.</p> <p>According to claim 7 the linear reading head is located in a compact and secure position below the magazine tubes of the magazine unit. The reading head is directed upwards towards the plane where the bases of the single-serving capsules are positioned within the magazine tubes, in such a way that the rotation-symmetrical identification on the base of the respective lowest single-serving capsule can be read.</p> <p>Mahlich at [0037]</p>
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	<p>The support frame 26 also carries a reading head 27 mainly consisting of a scan transmitter and an encoder receiver. Reading head 27 is pointing from below towards the turntable 11 in such a way that it is able to register and scan the single-serving capsules stacked with their base facing downwards inside the magazine tubes 12 to 16 when the magazine tubes are moved across the reading head 27.</p> <p>For this purpose at least part of turntable 11 is transparent to the scanning of the ID code: windows 29 located below the magazine tubes 12 to 16 are designed as slits and are each arranged at equal radial distance to a main axis 30 of turntable 11, cf. FIG. 3. The ID codes 3 on the bases 2 of the single-serving capsules can be registered across their greatest radius r_1 and r_2 through these slits, according to FIG. 1a. In this case ID code 3 is being registered on entering and on leaving the reading station when the base 2 of the capsule, equipped with the ID code, passes on its circular path across reading head 27 arranged in front of dispensing station 18 in the direction of rotation 28 of the turntable. It is thus guaranteed, via comparison of the two registered ID codes as well as via data processing, that only one single-serving capsule 1 containing the desired coffee type is conveyed to the dispensing station 18, once the desired coffee type has been selected, for example by means of a control panel or a knob.</p> <p>Mahlich at Fig. 3:</p>
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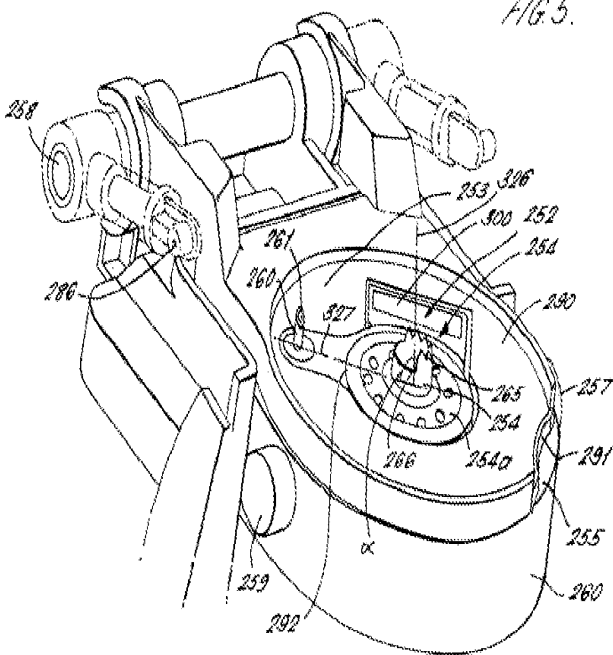
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	<p style="text-align: center;">Schnitt A-B Fig. 3</p>  <p>The drawing shows a vertical cross-section of a machine. At the top, a series of four tapered, funnel-like components (12) are stacked vertically. Below these, a horizontal plate (11) is shown. A central vertical passage (10) runs through the assembly. To the left of the central passage, there is a component (2) with a downward-pointing arrow (18) indicating flow. To the right, a component (23) is shown. Below the horizontal plate (11), there is a complex assembly of components including a valve or piston (25) and a cylindrical component (24). A bracket (20) groups components 22 and 21. At the bottom, a component (30) is shown with an upward-pointing arrow (10) indicating flow.</p> <p>Panesar at p. 4, ll. 24–29:</p> <p>The beverage preparation machine may comprise a brew head comprising an upwardly directed inlet for supplying water to the brew head, a downwardly directed outlet for outflow of beverage produced by the machine and a barcode or RFID reader having a window in the brew head through which signals may be transmitted . . .</p> <p>Panesar at p. 5, ll. 7–8:</p> <p>Preferably the barcode reader or RFID reader window is located at or near a periphery of the brew head.</p> <p>Panesar at p. 34, ll. 5–26:</p>
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	<p>The purpose of the recognition means 252 is to allow the machine 201 to recognize the type of beverage cartridge 1 that has been inserted and to adjust one or more operational parameters accordingly. In a typical embodiment, the recognition means 252 comprises an optical barcode reader which reads the printed barcode 320 provided on the laminate 5 of the beverage cartridge 1 as shown in Figure 10 and discussed above. The optical barcode reader comprises one or more LEDs 321 to illuminate the barcode 320, a focusing lens 322 to acquire an image of the barcode, a charge coupled device (CCD) 323 for producing an electrical signal representative of the acquired image and support circuitry for the LEDs and CCD. The space in the lower part for accommodating the barcode reader is limited. A mirror or mirrors 324 may be used to reflect the light from the LEDs 321 to a focusing lens which is not located in the lower part 255. Schematic arrangements are shown in Figures 9a and 9b. The lower part 255 comprises an aperture 326 which is the same size as the barcode 320 on the beverage cartridge 1. The aperture 326 is closed by a window, preferably glass, which can transmit the signals produced by the barcode reader.</p> <p>Panesar at p. 35, ll. 4–6:</p> <p>Alternatively, an RFID reader is provided to read an RFID located on the cartridge 1.</p> <p>Panesar at FIG. 5:</p>
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	<p style="text-align: right;"><i>FIG. 5.</i></p>  <p>Panesar at Claims 24, 27, 30.</p> <p>Rossi at Abstract:</p> <p>The process for controlling the operation of an edible-product making machine (1) of the type being fed with a single use load element (2) having a brewable or water soluble aromatic substance (3) for preparation of the edible product, comprises a first step of recognition wherein the edible-product making machine (1) recognises an identifying element (4) on the load element (2) allowing the edible-product making machine (1) to take further steps only if it also recognises on the load element (2) a validation element (5) to be validated, a second step of validation of the validation element (5), and a third step of activation wherein the edible-product making machine (1) automatically activates a cycle of production of the edible product only after having recognised on the load element (2) the identifying element (4) in combination with the validation element (5) as validated.</p>
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	<p>Rossi at 5-6:</p> <p>The use of a validation element and validation means, as well as the step allowing the machine to take further steps only if it also recognises on the load element the validation element help to prevent the use of an already-used single use load element in the machine, thereby avoiding the production of an edible product of inferior quality and ensuring the proper functioning of the machine. In the case of re-use of a load element originally containing a water soluble aromatic substance, the dynamics of the fluid flow through the machine could be different if there is no substance in the load unit for the water to contact, thereby causing incorrect functioning of the machine and the associated health hazard. The use of an activation step of automatically activating the cycle of edible-product production only when the same identifying element is recognised in combination with the validated validation element ensures that the operating conditions actually used are the correct conditions as selected by the machine in the first recognition step. This helps to prevent the user from making the mistake of inserting into the machine a different load element to the one that was first recognised, for which the operating conditions are set.</p> <p>Rossi at 7:</p> <p>The edible-product making machine is only allowed to take further steps if it in the first step also recognises on the load element a validation element to be validated. In practice, this may take the form of unlocking the machine when both the identification element and the unvalidated validation element are recognised. Thus, the production process cannot be activated unless the first step has been completed. The process could also require that the validation element be of a specific kind or be related to or associated to the identification element in a specific way in order for this first step to be completed. The validation element could be identical to the identification element, but is preferably different thereto, and could either be either of the same or of a different type to the identification element. If the identification element and the validation element are of different types, the recognition means for the two must accordingly also be different.</p> <p>Rossi at 8:</p>
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	<p>In a third step of the process, the product-making machine automatically activates a cycle of edible-product production. However, this is only after having recognised on the load element the same identifying element as that recognised in the first step, and it must be recognised in combination with the validation element as validated. As with the first and second steps, this step may take place inside or outside the machine. However, for reasons of cost efficiency, it is preferable to use the same recognition means in step three as in step one.</p> <p>Rossi at 9-10:</p> <p>The system further optionally comprises checking means connected to a control unit of the machine. This may be in the form of a computer programme within the control unit. The checking means compares the signal from the recognising means for the identifying element and the validation element with pre-stored data in order to allow the machine to proceed to activation only if it recognises the identifying element and the unvalidated validation element. The checking means may be connected to unlocking means for unlocking the machine when said recognition takes place.</p> <p>Rossi at 10:</p> <p>Figure 1 shows a schematic view of one embodiment of the system of the present invention.</p> <p>With reference to the above figure, the system comprises an edible-product making machine 1 and a single use load element in the form of a capsule 2. The load element contains a brewable or water soluble aromatic substance 3 for preparation of an edible product. The capsule 2 comprises an identifying element in the form of a barcode 4 and a validation element also in the form of a barcode 5, both located externally on a protective sheet 6 of the outlet base of the capsule. The machine 1 comprises recognising means in the form of an infrared barcode reader 7. This is connected to checking means 8 stored within a control unit 9 of the machine. The checking means allow the machine activation means 10 to be engaged only if the barcode reader 7 recognises the identification barcode 4 and the validation barcode 5. The machine 1 further comprises validation means in the form of a mechanical tool 11 having a plurality of tips for destroying the validation barcode 5, for example by ripping, cutting, scratching or piercing, such that the barcode reader 7 cannot recognise it as an</p>
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	<p>unvalidated validation barcode. If, after the positive signal from the checking means 8 from the first recognition of the identification and validation barcodes 4,5, the barcode reader 7 performs a second recognition of the identification barcode 4 combined with the validated validation barcode 5, the activation means 10, connected to the barcode reader 7 through the control unit 9, automatically activate a cycle of production of the edible product.</p> <p>Rossi at Claims 1, 13.</p> <p>Yoakim at [0025]:</p> <p>The device is useful for preparing beverages from a plurality of different capsules, in which case it further comprises identification means for identifying the different capsules, and control means capable of operating the device in centrifugation for any of the different capsules according to predetermined liquid food preparation parameters including the flow rate and the volume of liquid to be injected into the capsule, with the identification means comprising capsule recognition means which are recognized by sensing means connected to the control means of the device to control the preparation parameters accordingly.</p> <p>Yoakim at [0192]:</p> <p>Therefore, as much as two, three, four or even more different flow rates and/or speed ranges can be provided in function of the types of coffee to be delivered. Therefore, depending on the types of beverage to be brewed, the control unit can be programmed to adjust the optical centrifugal conditions. For instance, the control unit may be associated to a capsule recognition system enabling to recognize the types of capsules, i.e., espresso, lungo, cappuccino, long coffee (e.g., 180-400 ml), latte, tea, etc., and to adjust the speed and/or other brewing parameters (e.g., water temperature) according the capsule which is inserted in the device. A recognition system uses a code on the capsule and recognized by the device, such as a color, a barcode, an RFID, a magnetic code, ferromagnetic micro-wires or labels, shapes and combinations thereof.</p> <p>Yoakim at [0477]:</p> <p>The capsule system further comprises an identification means associated to the different capsules in the set for identifying each capsule and adjusting brewing parameters accordingly.</p>
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	<p>The adjustable parameters can be the rotational speed, the back-pressure at the outlet of the capsule, and/or the volume of liquid fed in the capsule. The identification means participates to deliver a wider range of beverages having differentiated characteristics (volume, taste, strength, crema, colour, etc.). The identification means are associated to control means placed in the centrifugal brewing device which controls the adjustment of the said parameters, by controlling the rotational motor driving the capsule holder or/and the pump supplying liquid in the capsule.</p> <p><i>See also</i> [1.1].</p>
2. The method according to claim 1, wherein the method comprises not activating the pump to push the heated water into the portion capsule upon a determination that the read barcode does not agree with the stored reference.	<p>The below cited art discloses, either expressly or inherently, the method according to claim 1, wherein the method comprises not activating the pump to push the heated water into the portion capsule upon a determination that the read barcode does not agree with the stored reference. <i>See, e.g.:</i></p> <p><i>See</i> [1.m].</p> <p><i>See also</i> [1].</p> <p>Jarisch at [0023]:</p> <p>The invention further relates to a system for preparing a beverage from a capsule as aforementioned and further comprising a beverage preparation device; wherein the device comprises capsule holding means for holding the capsule and rotational drive means for driving the holding means and capsule in rotation along said axis of rotation and reading means arranged for reading the code when the capsule is rotated along said axis.</p> <p>Jarisch at [0024]:</p> <p>In particular, the reading means may comprise a light emitter and a light sensor. In an alternative, the reading means comprises an inductive sensor. The optical reading means or inductive sensor may be arranged to detect a code on the rim of the capsule.</p>