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(54) **APPARATUS FOR MAKING A FOOD PRODUCT FOR MAKING A DRINK BY INFUSION IN A RESPECTIVE LIQUID**

VORRICHTUNG ZUR HERSTELLUNG EINES LEBENSMITTELPRODUKTS ZUR HERSTELLUNG EINES GETRÄNKES DURCH INFUSION IN EINER ENTSPRECHENDEN FLÜSSIGKEIT

APPAREIL DE FABRICATION D'UN PRODUIT ALIMENTAIRE POUR LA PRÉPARATION D'UNE BOISSON PAR INFUSION DANS UN LIQUIDE RESPECTIF

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Description

Technical field

[0001] The present invention relates to an apparatus for making a food product for obtaining a drink by infusion in a respective liquid.

Background art

[0002] Apparatuses are known for making a product, in particular for making a food product, preferably a food product for obtaining a drink by infusion in hot water, in which coffee or another infusion product is used as raw material.

[0003] The known apparatuses comprise respective supporting means for means for making respective products starting from a corresponding predetermined portion of raw material, in dissolved condition, which is inserted into a respective wrapper or container, for example, in the form of a bag of filter paper, or the like, or of a rigid capsule made of plastic material to be inserted into the infusion machine and then packaged in a protective outer packaging.

[0004] Patent document US 2008/0314003 A1 discloses a machine for making packs of infusion products, created by a first sheet of packaging material, forming a recess, in which a batched quantity of product is placed, and a second sheet of packaging material, applied on the first sheet of packaging material and joined thereto peripherally. The machine includes a work assembly for feeding the first sheets to a carousel, operated to rotate on a horizontal axis, in suitable step relation with the feeding of the sheets. The carousel has, made on its periphery, an ordered series of cavities, which receive the first sheets for forming thereon, a respective recess, whose shape is suitable for containing the batched quantity of product. A filling group introduces the batched quantity of product into the recess formed on the first sheets, connected to the cavities of the carousel. A group for feeding single second sheets joins mutually the first and second sheets in an area all around the recess filled the batched quantities of product. A discharge work assembly removes the packed products from the carousel.

[0005] The need is felt in the trade for an apparatus which allows obtaining alternative and/or improved new products of the above type, relative to those currently on the market.

[0006] Moreover, the known apparatuses have a problem in the movement and handling of the bulk material, or particles, for making the respective product, which is to be inserted into the respective wrapper or capsule and which is to be suitably fed into the respective apparatus. This material, which is kept in bulk condition, risks dirtying the apparatus and the ambient which it is a part of, with subsequent hygienic problems and the need to perform frequent cleaning, which in any case may not always be performed successfully.

[0007] The need therefore is felt in the trade for an apparatus which limits, to the maximum degree possible, the risk for the treated product to dirty the same apparatus and/or the ambient in which it is a part of.

[0008] Moreover, the need is felt in the trade for apparatuses which are easy to clean.

[0009] Moreover, the need is felt in the trade for apparatuses which have at least relatively high production outputs.

[0010] Moreover, the need is felt in the trade for apparatuses which are reliable and long-lasting.

[0011] Moreover, the need is felt in the trade for apparatuses which are easy to maintain and/or to manufacture, and also preferably have an at least relatively contained manufacturing cost.

[0012] Moreover, the need is equally felt in the trade for apparatuses which have a size, in particular a length, which is as contained as possible.

Disclosure of the invention

[0013] The present invention therefore proposes a new solution as an alternative to the solutions known up to now and, more specifically, proposes to overcome one or more of the above mentioned drawbacks or problems and/or to meet one or more of the needs felt in the trade or inferable from the above.

[0014] Therefore, an apparatus is provided for making food products for obtaining a corresponding drink by infusion in a respective liquid, according to claim 1.

[0015] In this way, it is possible to obtain a new, alternative product to the ones currently on the market.

Brief description of the drawings

[0016] These and other innovative aspects of the invention, or specific advantageous features, are set out in the appended claims and its technical features and advantages are apparent from the detailed description which follows of a preferred, advantageous embodiment of it, which must be considered purely as a non-limiting example; the description is made with reference to the accompanying drawings, in which:

- Figures from 1a) to 1h) are respective perspective views of four different embodiments of packages which can be made using the present apparatus according to the present invention;
- Figures from 2a) to 2q) are respective perspective views of the preferred steps of the preferred method implemented by the present apparatus to obtain a respective product;
- Figure 3 is a perspective view of a preferred embodiment of the apparatus according to the present invention;
- Figure 4 is a perspective view of the preferred embodiment of the apparatus according to the present invention, from the side opposite the one of Figure 3;

- Figure 5 is a perspective view of a detail relative to the assembly means of the product components of the preferred embodiment of the apparatus according to the present invention;
- Figure 6 is a perspective view of a detail relative to the assembly means of the product components taken from a different side relative to the one of Figure 5, of the preferred embodiment of the apparatus according to the present invention;
- Figure 7 is a perspective view of a detail relative to the conveyor means of the product of the preferred embodiment of the apparatus according to the present invention;
- Figure 8 is a perspective view of a detail relative to the packaging means of the product of the preferred embodiment of the apparatus according to the present invention.

Detailed description of preferred embodiments of the invention

[0017] Accompanying Figures 1 and 2 show a preferred embodiment 10 of an apparatus for making a food product P for making a drink by infusion in a respective liquid, into which the product is inserted.

[0018] The product being obtained from a raw material comprising or formed by respective particles.

[0019] As may be inferred from Figures 1a) and 1b), in conformity with a first preferred embodiment, the product P comprises a tablet of raw material M, for example roasted and ground coffee, the particles of which are adhering to each other, which tablet M is wrapped in an outer and surface layer adhering to it. The compress thus obtained is preferably, but not exclusively, packaged in an external wrapper, preferably in aluminium film I.

[0020] The product P of this first preferred embodiment advantageously comprises a respective front or upper face in which outer layer S there are provided respective punches or recesses R for the preferential percolating or directing of the infusion liquid in and through the same product.

[0021] A second embodiment of product P is shown in Figures 1c) and 1d), a third embodiment of product P is shown in Figures 1e) and 1f) and a fourth embodiment of product P is shown in Figures 1g) and 1h). These further embodiments have the same components as the first embodiment and differ from it in that they do not have the recesses for directing the infusion liquid, and in the shape of the outer layer.

[0022] As shown, the apparatus 10 comprises respective supporting means 12 for means 14 for making respective products starting from a corresponding predetermined portion of raw material.

[0023] Advantageously, the means 14 for making a respective product comprise means 16 for aggregating, in particular for reciprocally adhering, particles of raw material of the respective predetermined portion, preferably to form a compact tablet of the raw material.

[0024] This phase of aggregating, or compacting, is shown in Figure 2i) which places the present step in a preferred embodiment method of a respective product implemented by the present preferred embodiment of the apparatus.

[0025] Advantageously, the means 14 for making the product also comprise means 16, 18 for preparing an outer surface layer about the portion of raw material, which surface or outer layer is in particular in the form of a film of biodegradable and/or compostable material, especially of PLA, and preferably of filter material for the infusion liquid, and preferably is designed to completely surround or enclose the raw material.

[0026] Advantageously, the outer or surface layer is designed in particular to form means for containing the raw material during the steps of preparing the product.

[0027] Advantageously, the means 16, 18 for preparing an outer surface layer about the portion of raw material comprise means 16 designed to make the same outer or surface layer adhere to the portion of raw material. Advantageously, the means for aggregating, in particular for reciprocally adhering, particles of raw material of the respective predetermined portion, and/or the means designed to make the same outer or surface layer adhere to the portion of raw material, are in the form of means for dispensing vibrating energy, in particular ultrasonic energy, to the predetermined portion of raw material, in particular provided with the outer or surface layer.

[0028] Advantageously, vibrating or ultrasonic energy in a quantity between 500 and 6000 Joules, at a frequency between 16,000 and 35,000 Hertz, and for a time between 0.5 and 20 seconds, is imparted to the predetermined portion of raw material and/or to the respective outer or surface layer. Advantageously, the means for dispensing vibrating energy comprise respective sonotrode means 16.

[0029] The sonotrode means 16 can be activated and deactivated respectively between a condition of dispensing energy to the predetermined portion of raw material and/or to the respective outer surface layer, and a rest condition.

[0030] Advantageously, the means for dispensing vibrating energy comprise respective sonotrode means 16 which are movable between a position, in particular lowered, of dispensing energy to the respective portion of raw material and/or to the respective outer surface layer, and a position, in particular raised, of freely feeding the product.

[0031] Advantageously, the means for dispensing vibrating energy, or sonotrode means, comprise a plurality of elements or devices, especially a plurality of sonotrodes 16, in particular which are designed to dispense vibrating energy to a plurality of products simultaneously.

[0032] Advantageously, the sonotrode means 16, in particular the respective sonotrode 16, have a respective face for engaging an opposite face of the product, in particular of the corresponding outer layer of it, which face

for engaging the sonotrode is suitably shaped to form, in the opposite face of product, in particular in the corresponding outer layer of it, respective preferential percolating punches or recesses for the infusion liquid in and through the product.

[0033] Advantageously, as shown, the elements or devices, in particular the sonotrodes 16, are positioned in an orderly fashion in one or more transversal rows of the elements or devices, in particular the sonotrodes, and in one or more longitudinal rows of the same elements or devices, in particular of the sonotrodes, the transversal and/or longitudinal rows preferably being parallel to one another.

[0034] Advantageously, as may be inferred also with reference to Figure 3, there are provided means 18 for assembling product components, in particular forming means for preparing an outer surface layer about the respective predetermined portion of raw material, in particular in dissolved condition. In particular, the means 18 for assembling product components comprise means 20 with seats for receiving and supporting the material forming the outer layer and/or the respective predetermined portion of raw material.

[0035] In particular, the means with seats for receiving material forming the outer or surface layer and/or the respective predetermined portion of raw material advantageously comprise a plurality of seats 20, in particular positioned in an orderly fashion in one or more transversal rows of the seats and/or one or more longitudinal or circumferential rows of the same seats.

[0036] Advantageously, the seat means 20 are movable at respective operating stations for assembling product components.

[0037] Advantageously, as shown, the means 20 with seats for receiving material forming the outer surface layer and/or the respective predetermined portion of raw material are carried on a respective revolving wheel 22, in particular with an axis of rotation which extends transversal or horizontal. Further advantageously, the wheel 22 supporting the respective seat means 20 is movable in rotation, in particular with alternating feed motion and preferably having respective feed steps of the seat means between corresponding assembly stations and the subsequent stations, which are alternated with dwell steps at the respective assembly stations and at which respective assembly operations of product components are performed.

[0038] As shown, the means 18 for assembling product components advantageously comprise means 24 for preparing, or cutting by the respective film 24', a respective sheet of material for making an outer or surface layer of the product, as may be inferred from Figure 2a).

[0039] Advantageously, the means 18 for assembling product components comprise means 26 for applying a respective sheet of material for making an outer or surface layer of product to the corresponding seat means 20 of the same assembly means 18.

[0040] Advantageously, the means 24 for applying a

respective sheet of material for making an outer or surface layer of product to the corresponding seat means 20 of the same assembly means are formed by the same means for preparing, or cutting by a respective film 24', a respective sheet of material for making an outer or surface layer of product.

[0041] Advantageously, the means 18 for assembling product components comprise means 26 for shaping or forming, in particular on the seat means 20, a respective sheet of material for making an outer or surface layer of product to form a tray-like shape for receiving the portion of raw material, in particular in dissolved condition, as may be inferred from Figure 2b).

[0042] Advantageously, as shown, the means 26 for shaping or for forming a respective sheet of material for making an outer or surface layer of the product are positioned, according to the feed direction of the seat means, downstream, in particular immediately downstream, of the means 24 for applying the respective sheet of material on the seat means 20.

[0043] Advantageously, the means 18 for assembling product components comprise means 28 for dispensing the respective predetermined portion of raw material, in particular in dissolved condition, to the seat means 20, in particular on the respective sheet, preferably tray-shaped, of material forming the respective outer or surface layer of the product, as may be inferred from Figure 2c).

[0044] In particular, the means 28 for dispensing the respective predetermined portion of raw material are positioned, according to the feed direction of the seat means 20, downstream, in particular immediately downstream, of the means 26 for shaping the respective sheet on the seat means 20. Advantageously, the means 18 for assembling product components comprise means 30 for preparing, or cutting by a respective film 30', a respective second sheet of material for making the outer surface layer of product.

[0045] Advantageously, the means 18 for assembling product components comprise means 30 for applying the second sheet of material for making the outer or surface layer of product on the first sheet, in particular containing the predetermined portion of raw material, in particular in dissolved condition, especially on the seat means 20, as may be inferred from Figure 2d).

[0046] Advantageously, the means 30 for applying a respective second sheet of material for making the outer or surface layer of product to the corresponding seat means 20 of the same assembly means 18 are formed by the means for preparing, or cutting by a respective film 30', a respective second sheet of material for making the same outer surface layer of product.

[0047] Advantageously, as shown, the means 30 for applying a respective second sheet of material for making the outer or surface layer of product to the corresponding seat means 20, in particular on the corresponding first sheet of material for making the outer layer, with the interposition of the predetermined portion of raw material,

in particular in dissolved condition, are positioned, according to the feed direction of the seat means 20, downstream, in particular immediately downstream, of the means 28 for dispensing the respective predetermined portion of raw material.

[0048] Advantageously, the means 18 for assembling product components comprise, in particular on the seat means 20, means 32 for joining, in particular sealing, the second sheet of material for making the outer or surface layer of product to the first sheet of material for making the outer or surface layer of product, in particular at the respective peripheral edge surrounding the predetermined portion of raw material, preferably in dissolved condition, as may be inferred from Figure 2e).

[0049] Advantageously, the means 32 for joining, in particular sealing, the second sheet to the first sheet of the surface or outer layer of product are positioned, according to the feed direction of the seat means 20, downstream, in particular immediately downstream, of the means 30 for applying the second sheet on the seat means 20.

[0050] Advantageously, the means 18 for assembling product components comprise means 34 for cutting an excessive peripheral portion of the outer or surface layer of product, especially of the second sheet of material for making the outer or surface layer of product, in particular on the seat means 20, as may be inferred from Figure 2f).

[0051] Advantageously, as shown, the means 34 for cutting an excessive peripheral portion of the outer or surface layer of product are positioned, according to the feed direction of the seat means 20, downstream, in particular immediately downstream, of the means 32 for joining, or sealing, the first and second sheets forming the outer or surface layer of the product.

[0052] Advantageously, the means 18 which are designed to assemble the product components comprise means 36 for removing the waste material or the excessive peripheral portion of the outer or surface layer of product, in particular at the seat means 20, which element they are provided downstream of the means for cutting the excessive peripheral portion of the outer surface layer of product, in particular of the second sheet, as may be inferred from Figure 2g).

[0053] Further advantageously, the means 18 for assembling the product components comprise means 38 for unloading the product from the same seat means 20, which, as will be more apparent from the following description, dispense product onto corresponding conveyor means, in particular towards the compacting or ultrasonic treatment area and therefore, possibly, towards the packaging means, as may be inferred from Figure 2h).

[0054] In particular, as shown, the means 16 for making or for compacting the product advantageously are provided downstream of the means 18 for assembling product components, according to the direction of longitudinal extension of the apparatus.

[0055] Advantageously, there are provided means 40 for feeding the raw material.

[0056] Advantageously, the means 40 for feeding the raw material comprise means designed to release respective predetermined portions of raw material, in particular onto the seat means 20, preferably onto the first sheet of material for making the outer surface layer of product, especially positioned on the seat means 20.

[0057] In particular, as shown, the means for feeding the raw material advantageously comprise hopper means 40 for loading the same raw material.

[0058] Advantageously, the means 40 for feeding the raw material are provided above the means 18, in particular with a revolving wheel, for assembling product components.

[0059] Advantageously, there are provided means 42 for feeding a film 24' for forming the outer or surface layer of the product, in particular comprising corresponding means for supporting a respective reel of the film.

[0060] Further advantageously, there are provided means 44 for feeding a second film 30' for forming the outer or surface layer of the product, in particular comprising means for supporting a respective reel of the film.

[0061] Advantageously, the means 42, 44 for feeding the first 24' and second film 30' for forming the outer or surface layer of the product are provided upstream and/or downstream of the means 18 for assembling product components, in particular respectively provided upstream and downstream of the assembly means 18.

[0062] Advantageously, the present apparatus comprises means 50 for packaging the product in a respective outer package, in particular in the form of a respective outer wrapper.

[0063] In particular, the outer package, or outer wrapper, advantageously is formed by a corresponding film of material, in particular by aluminium film. Advantageously, the means 50 for packaging the product in a respective outer package, or outer wrapper, comprise means 52 for wrapping a corresponding film about the respective product, as may be inferred from Figure 2m).

[0064] Advantageously, the means for wrapping the film about the respective product comprise means 49 for pushing the product against a respective film, in particular transversal to the pushing direction, of corresponding material for the package or wrapper, and for further pushing the product together with the film until wrapping the product in the same film.

[0065] In this way, a single reel or film is used to make the outer package, thus advantageously achieving a compact configuration of apparatus, in particular which may be made with particularly contained length.

[0066] Advantageously, the packaging means 50, in particular the wrapping means 52, comprise a respective surface 54, in particular fixed, for supporting and preferably sliding products.

[0067] As may be inferred, the means 49 for pushing products of the wrapping means 52 advantageously operate on products which are supported on the supporting surface 54.

[0068] As shown, the means for pushing the product

against a respective film are in the form of a corresponding element, or comb unit 49, forming respective seat means 49' open at the front for receiving the back part of the respective product, and in particular extending transversely and having a plurality of seats 49' open at the front for receiving corresponding products.

[0069] As shown, the film 50' for making the package or wrapper advantageously passes through, in particular perpendicularly, the supporting surface 54, especially at or close to an end upstream of the same surface 54.

[0070] Advantageously, the packaging means 50 comprise means 56 for joining opposite ends of respective opposite flaps of the film 50' forming the outer wrapper, which are positioned in condition of wrapped about the respective product, as may be inferred from Figure 2n).

[0071] Advantageously, the packaging means 50 comprise means 58 for reciprocally joining, or sealing, opposite and matching flaps, or tabs, of the film forming the outer wrapper 50' with the respective product interposed therein, as may be inferred from Figure 2o. The joining or sealing of the opposite flaps, or tabs, being performed along the respective perimeter surrounding the compact product.

[0072] As shown, the packaging means 50 advantageously comprise means 60 for separating, or cutting, the package or wrapper containing the product from the respective film 50' forming the outer wrapper, as may be inferred from Figure 2p).

[0073] Moreover, the packaging means 50 comprise means 62 for unloading the packaged product, as may be inferred from Figure 2q).

[0074] Advantageously, as shown, the means 50 for packaging the product are positioned downstream, in particular longitudinally aligned downstream, of the means 16 for making the product, or sonotrode means.

[0075] Advantageously, there are provided means 70 for conveying products along the apparatus, in particular between means 18 for assembling product components and means 50 for packaging the same products and/or at the means 16 for making products, in particular the means 16 for aggregating or dispensing mechanical vibrating energy, preferably ultrasonic, to the same products.

[0076] Advantageously, the means 70 for conveying products are provided under the means 16 for aggregating particles of raw material of the respective predetermined portion, and/or of the means designed to make the same outer or surface layer adhere to the portion of raw material, that is means for aggregating or means for dispensing vibrating mechanical energy to the same products.

[0077] Advantageously, the means 70 for conveying products comprise means 72, 74, 76 for supporting corresponding products forming part of the means for making the product, in particular part of the means 16 for aggregating the particles of raw material of the respective predetermined portion, and/or part of the means designed to make the same outer surface layer adhere to

the respective predetermined portion of raw material, especially thus forming means 72, 74, 76 for supporting the engaged products of the sonotrode means 16.

[0078] Advantageously, the means 70 for conveying products comprise first means 72 for supporting respective products and second means 74 for supporting respective products, and possibly third means 76 for supporting respective products, which are movable separately from and/or independently of each other, respectively at the means 16 for making products, at the means 50 for packaging products or at the means 18 for assembling components of the same products.

[0079] Although it is not particularly shown in the accompanying figures, the means 70 for conveying products comprise first movement means for corresponding first means 72 for supporting products and second movement means for corresponding second means 74 for supporting products and possibly third movement means for corresponding third means 76 for supporting products.

[0080] Advantageously, the respective means 72, 74, 76 for supporting products of the conveyor means 70 comprise a plurality of seats 71 for housing a respective product, in particular positioned in an orderly fashion according to one or more transversal rows of the seats 71 and/or according to one or more longitudinal rows of the same seats 71.

[0081] Advantageously, the respective means 72, 74, 76 for supporting products of the conveyor means 70 are carried by respective movement means, which are movable, in particular separately from and independently of each other. These movement means not being particularly shown in the accompanying figures and in any case preferably being in the form of respective endless, elongate, continuous means, in particular in the form of a first and a second elongate, continuous element for corresponding means, or plates, 72, 74 or 76 for supporting respective products. The continuous elongate elements extend parallel to one another and transversely spaced apart and the corresponding means, or plates, 72, 74, 76 for supporting products extend between them.

[0082] As shown, there are provided advantageous means 48 for product passage from the conveyor means 70, in particular from the respective supporting means 72, 74, 76, to the packaging means 50, as may be inferred from Figure 2i).

[0083] Advantageously, as shown, the means for product passage are in the form of means 48 for picking the same products from the conveyor means 70 and for releasing them onto the packaging means 50, in particular onto a respective supporting and sliding surface of them, preferably by positioning them at the end upstream of this supporting and sliding surface.

[0084] Advantageously, as shown, the supporting means 12 of the apparatus comprise an intermediate wall 121, in particular extending longitudinally, which separates the side provided with respective operating means, respectively the means 18 for assembling product components, the means 16 for making the product, the means

70 for conveying products and/or the means 48 for product passage and/or the means 50 for packaging the same products, from the side provided with the respective actuator means. In particular, as shown, the respective operating means, in particular the means 18 for assembling product components, the means 16 for making products, the means 70 for conveying products, the means 48 for product passage, and/or the means 50 for packaging the same products, extend in cantilever fashion from the intermediate separating wall 121.

[0085] Advantageously, as shown, the intermediate wall 121 separates the means for supporting the reel of the respective film 24', 30' for the respective or for both sheets forming the outer layer of material, and/or separates the means for supporting the reel for the packaging wrapper 50' from the operating means, in particular from the means 18 for assembling product components, from the means 16 for making products, from the means 70 for conveying products, from the means 48 for product passage, and/or from the means 50 for packaging the same products, and on which side the respective film is passed through corresponding slot means provided in the separating wall 121.

[0086] In this way, an apparatus with a particularly reduced size in length may be obtained.

[0087] In particular, the respective operating means, in particular the means 18 for assembling product components, the means 16 for making products, the means 70 for conveying products, the means 48 for product passage, and/or the means 50 for packaging the same products, comprise a plurality of parallel rows or lines for making the product.

[0088] Thus, an apparatus has been provided with respective features, shown above, which allow obtaining alternative and/or improved new products of the above type, relative to those currently on the market.

[0089] An apparatus has also been provided with respective features, shown above, which allow avoiding the apparatus and ambient in which it is inserted from being dirtied.

[0090] An apparatus has also been provided with respective features, shown above, which allow easy cleaning.

[0091] An apparatus has also been provided with respective features, shown above, which allow at least relatively high production outputs.

[0092] An apparatus has also been provided with respective features, shown above, which allow having a reliable and long-lasting apparatus available.

[0093] An apparatus has also been provided with respective features, shown above, which allow obtaining easy maintenance and/or manufacturing of the apparatus, and also an at least relatively contained manufacturing cost.

[0094] An apparatus has also been provided with respective features, shown above, which allow avoiding an excessive size, in particular a length.

[0095] The invention described has evident industrial

applications. It would be obvious to one skilled in the art that several changes and modifications can be made to the invention without departing from the scope of the invention, described in depth above and restricted to the subject-matter of the appended claims. It is also easy to imagine further embodiments of the invention comprising one or more of the features described herein. Moreover, it will be understood that all the details of the invention may be substituted for technically equivalent elements.

Claims

1. An apparatus (10) for making products (P) for obtaining a corresponding drink by infusion in a respective liquid; the respective product being obtained from a raw material comprising or formed by respective particles; the apparatus comprising supporting means (12) for means (14) for making respective products starting from a corresponding predetermined portion of raw material, the means (14) for making respective products comprising means (16) for aggregating particles of raw material of the respective predetermined portion; wherein:

- the means for aggregating particles of raw material of the respective predetermined portion, are in the form of means (16) for dispensing ultrasonic energy to the predetermined portion of raw material;
- the means for dispensing comprise respective sonotrode means (16);
- the sonotrode means (16) have a respective face for engaging an opposite face the corresponding outer layer of the product, which face for engaging being suitably shaped to form, in the opposite face of product respective preferential percolating punches or recesses for the infusion liquid in and through the product;
- the apparatus comprises means (18) for assembling product components;
- the means (18) for assembling product components comprise means (20) with seats for receiving material forming the outer or surface layer of the product;
- the means with seats for receiving material forming the outer or surface layer comprise a plurality of seats (20) positioned in an orderly fashion in one or more transversal rows of the seats and/or one or more longitudinal or circumferential rows of the same seats;
- the seat means (20) are movable at respective operating stations for assembling product components;
- the means (20) with seats for receiving material forming the outer or surface layer and/or the respective predetermined portion of raw material

are carried on a respective revolving wheel (22), with a transversal or horizontal axis;

- the wheel (22) supporting the respective seat means (20) is movable in rotation, with alternating feed motion and having respective feed steps between corresponding assembly stations and the subsequent stations, which are alternated with dwell steps at the respective assembly stations and at which respective assembly operations of product components are performed;
- the means (18) for assembling product components comprise means (24) for preparing, or cutting by a respective film (24'), a respective sheet of material for making an outer or surface layer of product;
- the means (18) for assembling product components comprise means (24) for applying a respective sheet of material for making an outer or surface layer of product to the corresponding seat means (20) of the same assembly means;
- the means (24) for applying are formed by the means for preparing, or cutting by a respective film (24');
- the means (18) for assembling product components comprise means (26) for shaping or forming, on the seat means (20), a respective sheet of material for making an outer or surface layer of the product to form a tray-like shape for receiving the portion of raw material;
- the means (26) for shaping or for forming a respective sheet of material for making an outer or surface layer of the product are positioned, according to the feed direction of the seat means (20), downstream of the means (24) for applying the respective sheet on the seat means (20);
- the means (18) for assembling comprise means (28) for dispensing the respective predetermined portion of raw material to the seat means (20), on the respective sheet tray-shaped of material forming the respective outer or surface layer of product;
- the means (28) for dispensing the respective predetermined portion of raw material are positioned, according to the feed direction of the seat means (20), downstream, in particular immediately downstream, of the means (26) for shaping the respective sheet on the seat means (20);
- the means (18) for assembling product components comprise means (30) for preparing, or cutting by a respective film (30'), a respective second sheet of material for making the outer or surface layer of product;
- the means (18) for assembling product components comprise means (30) for applying the second sheet of material for making the outer or surface layer of product on the first sheet, in particular containing the predetermined portion of

raw material, preferably in dissolved condition, in particular on the seat means (20);

- the means (30) for applying a respective second sheet of material for making the outer or surface layer of product to the corresponding seat means (20) of the same assembly means are formed by the same means for preparing, or cutting by a respective film (30'), a respective second sheet of material for making the same outer or surface layer of product;
- the means (30) for applying a respective second sheet of material for making the outer or surface layer of product to the corresponding seat means (20) are positioned, according to the feed direction of the seat means (20), downstream, in particular immediately downstream, of the means (28) for dispensing the respective predetermined portion of raw material;
- the means (18) for assembling product components comprise, in particular on the seat means (20), means (32) for joining, in particular sealing, the second sheet of material for making the outer or surface layer of product to the first sheet of material for making the outer or surface layer of product, in particular at the respective peripheral edge surrounding the predetermined portion of raw material, preferably in dissolved condition;
- the means (32) for joining, in particular sealing, the second sheet to the first sheet of the outer or surface layer of product are positioned according to the feed direction of the seat means (20), downstream, in particular immediately downstream, of the means (30) for applying the second sheet on the seat means (20).
- the means (18) for assembling product components comprise means (34) for cutting an excessive peripheral portion of the outer or surface layer of product, especially of the second sheet of material for making the outer or surface layer of product, in particular on the seat means (20);
- the means (34) for cutting an excessive peripheral portion of the outer or surface layer of product are positioned, according to the feed direction of the seat means (20), downstream, in particular immediately downstream, of the means (32) for joining, or sealing, the first and second sheets forming the outer or surface layer of the product;
- the means (18) for assembling product components comprise means (36) for removing the waste material or excessive peripheral portion of the outer or surface layer of product, in particular at the seat means (20);
- the means (18) for assembling product components comprise means (38) for unloading the product from the seat means (20);
- it comprises means (50) for packaging the

product in a respective outer package, in particular in the form of a respective outer wrapper;

characterized in that:

- 5
- the means (16) for making the product are provided downstream of the means (18) for assembling product components;
- there are provided means (70) for conveying products along the apparatus, between means (18) for assembling product components and the means (50) for packaging the same products;
- the means (70) for conveying products are at the means (16) for aggregating;
- 10
- the means (70) for conveying products are provided under the means (16) for aggregating.
- 15
2. The apparatus according to claim 1, **characterised in that** vibrating or ultrasonic energy in a quantity between 500 and 6,000 Joules, at a frequency between 16,000 and 35,000 Hertz, and for a time between 0.5 and 20 seconds, is imparted to the predetermined portion of raw material and/or to the respective outer or surface layer. 20
- 25
3. The apparatus according to claim 1 or 2, **characterised in that** the sonotrode means (16) can be activated and deactivated respectively in a condition of dispensing energy to the predetermined portion of raw material and/or to the respective outer or surface layer, and in a rest condition. 30
- 35
4. The apparatus according to any of previous claims, **characterised in that** the means for dispensing ultrasonic energy are movable between a position, in particular lowered, of dispensing energy to the respective portion of raw material and/or to the respective outer or surface layer, and a raised position of freely feeding the product. 40
- 45
5. The apparatus according to any of previous claims, **characterised in that** the means for dispensing ultrasonic energy comprise a plurality of sonotrodes (16) designed to dispense vibrating energy to a plurality of products simultaneously. 45
- 50
6. The apparatus according to claim 5, **characterised in that** the the sonotrodes (16), are positioned in an orderly fashion in one or more transversal rows of the sonotrodes, and/or in one or more longitudinal rows of the sonotrodes.
- 55
7. The apparatus according to any of the previous claims, wherein:
 - it comprises means (40) for feeding the raw material;

- the means (40) for feeding the raw material comprise means designed to release respective predetermined portions of raw material, in particular onto the seat means (20), preferably onto the first sheet of material for making the outer or surface layer of product, especially positioned on the seat means (20);
- the means for feeding the raw material comprise hopper means (40) for loading the raw material;
- the means (40) for feeding the raw material are provided above the means (18), in particular with a revolving wheel, for assembling product components.

8. The apparatus according to any one of the preceding claims wherein:

- the outer package, or outer wrapper, is formed by a corresponding film of material, in particular by an aluminium film;
- the means (50) for packaging the product in a respective outer package, or outer wrapper, comprise means (52) for wrapping a corresponding film (50') about the respective product;
- the means for winding the film about the respective product comprise means (49) for pushing the product against a respective film (50') of corresponding material for the package or wrapper, and for pushing the product together with the film until wrapping the product in the same film;
- the packaging means (50), in particular the wrapping means (52), comprise a respective surface (54), in particular fixed, for supporting, and preferably sliding, products;
- the means (49) for pushing products of the wrapping means (52) operate on products which are supported on the supporting surface (54);
- the film (50') for making the packaging or wrapper passes through, in particular perpendicularly, the supporting surface (54), in particular at an end upstream of the same surface (54).

9. The apparatus according to claim 8, wherein

- the packaging means (50) comprise means (56) for joining or sealing opposite ends of respective flaps of the film forming the outer wrapper (50') in condition of wrapped about the respective product;
- the packaging means (50) comprise means (58) for reciprocally joining, or sealing, opposite and matching flaps of the film forming the outer wrapper (50') with the respective product interposed therein;
- the packaging means (50) comprise means (60) for separating or cutting the package or

wrapper containing the product, from the respective film (50') forming the outer wrapper;
 - the packaging means (50) comprise means (62) for unloading the packaged product.
 - the means (50) for packaging the product are positioned downstream, in particular longitudinally aligned downstream, of the means (16) for making the product, or sonotrode means.

10. The apparatus according to claim 9, wherein:

- the means (70) for conveying products comprise means (72, 74, 76) for supporting corresponding products forming part of the means for making the product, in particular part of the means (16) for aggregating the particles of raw material before the respective predetermined portion, and/or part of the means designed to make the same outer or surface layer adhere to the respective predetermined portion of raw material, especially thus forming means (72, 74, 76) for supporting engaged products of the aggregation sonotrode means (16);
 - the means (70) for conveying products comprise first means (72) for supporting respective products and second means (74) for supporting respective products, and possibly third means (76) for supporting respective products, which are movable separately from and/or independently of each other, respectively at the means (16) for making products, at the means (50) for packaging products or at the means (18) for assembling components of the same products;
 - the means (70) for conveying products comprise first movement means for corresponding first means for supporting products (72) and second movement means for corresponding second means for supporting products (74) and possibly third movement means for corresponding third means for supporting products (76).

11. The apparatus according to claim 10, wherein:

- the respective means (72, 74, 76) for supporting products of the conveyor means (70) comprise a plurality of seats (71) for housing a respective product, in particular positioned in an orderly fashion according to one or more transversal rows of the seats (71) and/or according to one or more longitudinal rows the same seats (71);
 - the respective means (72, 74, 76) for supporting products of the conveyor means (70) are carried by respective movement means, which are movable, in particular separately from and independently of each other;
 - the movement means are in the form of respective endless, elongate, continuous means car-

ried on respective operating and drive end wheels of the continuous means, in particular in the form of a first and a second elongate, continuous element for corresponding means or plate (72, 74, 76) for supporting respective products, and extending parallel to and transversally spaced from each other, between which extend corresponding means for supporting products (72, 74, 76).

- there are provided means (48) for product passage from the conveyor means (70), in particular from the respective supporting means (72, 74, 76), to the packaging means (50);

- the means for product passage are in the form of means (48) for picking products from the conveyor means (70) and releasing them onto the packaging means (50), in particular onto a respective supporting and sliding surface of them;

- the supporting means (12) comprise an intermediate wall (121), in particular extending longitudinally, which separates the side provided with respective operating means, in particular the means (18) for assembling product components, the means (16) for making products, the means (70) for conveying products and the means (50) for packaging the same products, from the side provided with the respective actuator means;

- the respective operating means, in particular the means (18) for assembling product components, the means (16) for making products, the means (70) for conveying products and/or the means (50) for packaging the same products, extend in cantilever fashion from the intermediate separating wall (121);

- the intermediate wall (121) separates the means for supporting the reel of the respective film (24', 30'), for the respective or for both sheets forming the outer layer of material, and/or separates the means for supporting the reel for the packaging wrapper (50'), from the operating means, in particular from the means (18) for assembling product components, from the means (16) for making products, from the means (70) for conveying products and/or from the means (50) for packaging the same products, and on which side the respective film is passed through corresponding slot means provided in the separating wall (121);

- the respective operating means, in particular the means (18) for assembling product components, the means (16) for making products, the means (70) for conveying products, the means for product passage, and/or the means (50) for packaging the same products, comprise a plurality of parallel rows or lines for making the product.;

- the means for pushing the product against a

respective film of the packaging means (50) are in the form of a corresponding element, or comb unit (49), forming respective seat means open at the front (49') for receiving the back part of the respective product, in particular extending transversely and having a plurality of seats (49') open at the front for receiving corresponding products.

Patentansprüche

1. Vorrichtung (10) zur Herstellung von Produkten (P) zum Erhalten eines entsprechenden Getränks durch Infusion in einer jeweiligen Flüssigkeit; wobei das jeweilige Produkt aus einem Rohstoff erhalten wird, der die jeweiligen Partikel umfasst oder aus diesen gebildet ist; wobei die Vorrichtung Tragmittel (12) für Mittel (14) zur Herstellung jeweiliger Produkte ausgehend von einer entsprechenden vorbestimmten Portion von Rohstoff umfasst, wobei die Mittel (14) zur Herstellung jeweiliger Produkte Mittel (16) zum Aggregieren von Rohstoffpartikeln der jeweiligen vorbestimmten Portion umfassen; wobei:

- die Mittel zum Aggregieren von Rohstoffpartikeln der jeweiligen vorbestimmten Portion in Form von Mitteln (16) zum Abgeben von Ultraschallenergie an die vorbestimmte Portion von Rohstoff sind;
- die Mittel zum Abgeben jeweilige Sonotrodenmittel (16) umfassen;
- die Sonotrodenmittel (16) eine jeweilige Fläche zum Eingreifen in eine gegenüberliegende Fläche der entsprechenden Außenschicht des Produkts aufweisen, wobei diese Fläche zum Eingreifen geeignet geformt ist, um in die gegenüberliegende Fläche des Produkts jeweilige präferenzielle Perkulationsstempel oder Aussparungen für die Infusionsflüssigkeit im und durch das Produkt zu bilden;
- die Vorrichtung Mittel (18) zum Zusammenbauen von Produktkomponenten umfasst;
- die Mittel (18) zum Zusammenbauen von Produktkomponenten Mittel (20) mit Sitzen zum Empfangen von Material umfassen, das die Außen- oder Oberflächenschicht des Produkts bildet;
- die Mittel mit Sitzen zum Empfangen von Material, das die Außen- oder Oberflächenschicht des Produkts bildet, eine Vielzahl an Sitzen (20) umfassen, die in einer oder mehreren Querreihen der Sitze und/oder einer oder mehreren Längs- oder Umfangsreihen derselben Sitze in einer geordneten Weise positioniert sind;
- die Sitzmittel (20) an jeweiligen Betriebsstationen zum Zusammenbauen von Produktkompo-

nenten beweglich sind;

- die Mittel (20) mit Sitzen zum Empfangen von Material, das die Außen- oder Oberflächenschicht des Produkts bildet, und/oder der jeweiligen vorbestimmten Portion von Rohstoff auf einem jeweiligen Drehrad (22) mit einer Quer- oder Horizontalachse transportiert werden;
- das die jeweiligen Sitzmittel (20) tragende Rad (22) drehbeweglich, mit abwechselnder Zuführungsbewegung, ist und aufweisend jeweilige Zuführungsschritten zwischen entsprechenden Zusammenbaustationen und den nachfolgenden Stationen, die mit Verweilschritten an den jeweiligen Zusammenbaustationen abwechseln und an welchen jeweilige Zusammenbauvorgänge von Produktkomponenten durchgeführt werden;
- die Mittel (18) zum Zusammenbauen von Produktkomponenten Mittel (24) zum Vorbereiten oder Schneiden, aus einer jeweiligen Folie (24'), einer jeweiligen Materialbahn zur Herstellung einer Außen- oder Oberflächenschicht des Produkts umfassen;
- die Mittel (18) zum Zusammenbauen von Produktkomponenten Mittel (24) zum Aufbringen einer jeweiligen Materialbahn zur Herstellung einer Außen- oder Oberflächenschicht des Produkts auf die entsprechenden Sitzmittel (20) derselben Zusammenbaumittel umfassen;
- die Mittel (24) zum Aufbringen durch die Mittel zum Vorbereiten oder Schneiden aus einer jeweiligen Folie (24') gebildet sind;
- die Mittel (18) zum Zusammenbauen von Produktkomponenten Mittel (26) umfassen, um auf den Sitzmitteln (20) eine jeweilige Materialbahn zur Herstellung einer Außen- oder Oberflächenschicht des Produkts zu formen oder zu bilden, um eine schalenförmige Form zum Empfangen der Portion von Rohstoff zu bilden;
- die Mittel (26) zum Formen oder zum Bilden einer jeweiligen Materialbahn zur Herstellung einer Außen- oder Oberflächenschicht des Produkts nach der Zuführung der Sitzmittel (20) stromabwärts der Mittel (24) zum Aufbringen der jeweiligen Bahn auf die Sitzmittel (20) positioniert sind;
- die Mittel (18) zum Zusammenbauen Mittel (28) zum Abgeben der jeweiligen vorbestimmten Portion von Rohstoff an die Sitzmittel (20) auf der jeweiligen schalenförmigen Bahn von Material umfassen, das die jeweilige Außen- oder Oberflächenschicht des Produkts bildet;
- die Mittel (28) zum Abgeben der jeweiligen vorbestimmten Portion von Rohstoff nach der Zuführung der Sitzmittel (20) stromabwärts, insbesondere unmittelbar stromabwärts, der Mittel (26) zum Formen der jeweiligen Bahn auf die Sitzmittel (20) positioniert sind;

- die Mittel (18) zum Zusammenbauen von Produktkomponenten Mittel (30) zum Vorbereiten oder Schneiden, aus einer jeweiligen Bahn (30'), einer jeweiligen zweiten Materialbahn zur Herstellung der Außen- oder Oberflächenschicht des Produkts umfassen; 5

- die Mittel (18) zum Zusammenbauen von Produktkomponenten Mittel (30) zum Aufbringen der zweiten Materialbahn zur Herstellung der Außen- oder Oberflächenschicht des Produkts auf die erste Bahn umfassen, die insbesondere die vorbestimmte Portion von Rohstoff, vorzugsweise in gelöstem Zustand, insbesondere auf den Sitzmitteln (20) enthalten; 10

- die Mittel (30) zum Aufbringen einer jeweiligen zweiten Materialbahn zur Herstellung der Außen- oder Oberflächenschicht des Produkts auf die entsprechenden Sitzmittel (20) derselben Zusammenbaumittel durch dieselbe Mittel zum Vorbereiten oder Schneiden, aus einer jeweiligen Bahn (30'), einer jeweiligen zweiten Materialbahn zur Herstellung derselben Außen- oder Oberflächenschicht des Produkts gebildet werden; 15

- die Mittel (30) zum Aufbringen einer jeweiligen zweiten Materialbahn zur Herstellung der Außen- oder Oberflächenschicht des Produkts auf die entsprechenden Sitzmittel (20) nach der Zuführrichtung der Sitzmittel (20), stromabwärts, insbesondere unmittelbar stromabwärts, der Mittel (28) zum Abgeben der jeweiligen vorbestimmten Portion von Rohstoff positioniert sind; 20

- die Mittel (18) zum Zusammenbauen von Produktkomponenten, insbesondere auf den Sitzmitteln (20), Mittel (32) zum Verbinden, insbesondere Versiegeln, der zweiten Materialbahn zur Herstellung der Außen- oder Oberflächenschicht des Produkts mit der ersten Materialbahn zur Herstellung der Außen- oder Oberflächenschicht des Produkts, insbesondere an der jeweiligen Umfangskante, die die vorbestimmte Portion von Rohstoff umgibt, vorzugsweise in gelöstem Zustand, umfassen; 25

- die Mittel (32) zum Verbinden, insbesondere Versiegeln, der zweiten Bahn mit der ersten Bahn der Außen- oder Oberflächenschicht des Produkts nach der Zuführrichtung der Sitzmittel (20), stromabwärts, insbesondere unmittelbar stromabwärts, der Mittel (30) zum Aufbringen der zweiten Bahn auf die Sitzmittel (20) positioniert sind; 30

- die Mittel (18) zum Zusammenbauen von Produktkomponenten Mittel (34) zum Schneiden eines übermäßigen Umfangsabschnitts der Außen- oder Oberflächenschicht des Produkts, insbesondere der zweiten Materialbahn zur Herstellung der Außen- oder Oberflächenschicht des Produkts, insbesondere auf die Sitzmittel 35

(20) umfassen;

- die Mittel (34) zum Schneiden eines übermäßigen Umfangsabschnitts der Außen- oder Oberflächenschicht des Produkts nach der Zuführrichtung der Sitzmittel (20), stromabwärts, insbesondere unmittelbar stromabwärts, der Mittel (32) zum Verbinden oder Versiegeln der ersten und zweiten Bahn positioniert sind, die die Außen- oder Oberflächenschicht des Produkts bilden;

- die Mittel (18) zum Zusammenbauen von Produktkomponenten Mittel (36) zum Entfernen des Abfallmaterials oder überschüssigen Umfangsabschnitts der Außen- oder Oberflächenschicht des Produkts, insbesondere an den Sitzmitteln (20), umfassen;

- die Mittel (18) zum Zusammenbauen von Produktkomponenten Mittel (38) zum Entladen des Produkts von den Sitzmitteln (20) umfassen;

- die Mittel (50) zum Verpacken des Produkts in einer jeweiligen Außenverpackung, insbesondere in Form einer jeweiligen Außenumhüllung umfasst;

dadurch gekennzeichnet, dass

- die Mittel (16) zur Herstellung des Produkts stromabwärts der Mittel (18) zum Zusammenbauen von Produktkomponenten vorgesehen sind;

- es Mittel (70) zum Befördern von Produkten entlang der Vorrichtung zwischen Mitteln (18) zum Zusammenbauen von Produktkomponenten und Mitteln (50) zum Verpacken derselben Produkte vorgesehen sind;

- die Mittel (70) zum Befördern von Produkten an den Mitteln (16) zum Aggregieren sind;

- die Mittel (70) zum Befördern von Produkten unter den Mitteln (16) zum Aggregieren vorgesehen sind.

2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** Schwingungs- oder Ultraschallenergie in einer Menge zwischen 500 und 6.000 Joule bei einer Frequenz zwischen 16.000 und 35.000 Hertz und für eine Zeit zwischen 0,5 und 20 Sekunden an die vorbestimmte Portion von Rohstoff und/oder die jeweilige Außen- oder Oberflächenschicht beaufschlagt wird. 40
3. Vorrichtung nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Sonotrodenmittel (16) jeweils in einem Zustand zur Abgabe von Energie an die vorbestimmte Portion von Rohstoff und/oder an die jeweilige Außen- oder Oberflächenschicht und in einem Ruhezustand aktiviert und deaktiviert werden können. 45
4. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Mittel 50

- zum Abgeben von Ultraschallenergie zwischen einer Position, insbesondere abgesenkt, zur Abgabe von Energie an die jeweilige Portion von Rohstoff und/oder an die jeweilige Außen- oder Oberflächenschicht und eine angehobene Position zum freien Zuführen des Produktes beweglich sind. 5
5. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Mittel zum Abgeben von Ultraschallenergie eine Vielzahl an Sonotroden (16) umfassen, die dazu ausgestaltet sind, um Schwingungsenergie gleichzeitig an eine Vielzahl an Produkten abzugeben. 10
6. Vorrichtung nach Anspruch 5, **dadurch gekennzeichnet, dass** die Sonotroden (16) in einer oder mehreren Querreihen der Sonotroden und/oder in einer oder mehreren Längsreihen der Sonotroden in einer geordneten Weise positioniert sind. 15 20
7. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei:
- sie Mittel (40) zum Zuführen vom Rohstoff umfasst; 25
 - die Mittel (40) zum Zuführen vom Rohstoff Mittel umfassen, die dazu ausgestaltet sind, jeweilige vorbestimmte Portionen von Rohstoff freizugeben, insbesondere auf die Sitzmittel (20), vorzugsweise auf die erste Materialbahn zur Herstellung der Außen- oder Oberflächenschicht des Produkts, besonders auf den Sitzmitteln (20) positioniert; 30
 - die Mittel zum Zuführen vom Rohstoff Trichtermittel (40) zum Laden vom Rohstoff umfassen; 35
 - die Mittel (40) zum Zuführen vom Rohstoff oberhalb der Mittel (18), insbesondere mit einem Drehrad, vorgesehen sind, um Produktkomponenten zusammenzubauen. 40
8. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei:
- die Außenverpackung, oder Außenumhüllung, durch eine entsprechende Materialfolie, insbesondere durch eine Aluminiumfolie, gebildet ist; 45
 - die Mittel (50) zum Verpacken des Produkts in einer jeweiligen Außenverpackung, oder Außenumhüllung, Mittel (52) zum Umhüllen einer entsprechenden Folie (50') um das jeweilige Produkt umfassen; 50
 - die Mittel zum Wickeln der Folie um das jeweilige Produkt Mittel (49) zum Drücken des Produkts gegen eine jeweilige Folie (50') aus entsprechendem Material für die Verpackung oder Umhüllung und zum Drücken des Produkts zusammen mit der Folie bis zur Umhüllung des Produkts in derselben Folie; 55
- die Verpackungsmittel (50), insbesondere die Umhüllungsmittel (52), eine jeweilige Oberfläche (54), insbesondere feststehend, zum Tragen und vorzugsweise Schieben von Produkten umfassen;
 - die Mittel (49) zum Drücken von Produkten der Umhüllungsmittel (52) auf Produkte, die auf der Tragfläche (54) getragen werden, wirken;
 - die Folie (50') zur Herstellung der Verpackung oder Umhüllung, insbesondere senkrecht, durch die Tragfläche (54), insbesondere an einem derselben Oberfläche (54) vorgelagerten Ende durchläuft.
9. Vorrichtung nach Anspruch 8, wobei
- die Verpackungsmittel (50) Mittel (56) zum Verbinden oder Versiegeln gegenüberliegender Enden der jeweiligen Klappen der Folie, die die Außenumhüllung (50') bilden, in einem Zustand, in dem sie um das jeweilige Produkt umhüllt sind, umfassen;
 - die Verpackungsmittel (50) Mittel (58) zum wechselseitigen Verbinden oder Versiegeln gegenüberliegender und zusammenpassender Klappen der Folie, die die Außenumhüllung (50') bilden, mit dem jeweiligen darin angeordneten Produkt umfassen;
 - die Verpackungsmittel (50) Mittel (60) zum Trennen oder Schneiden der das Produkt enthaltenden Verpackung oder Umhüllung aus der jeweiligen Folie (50'), die die Außenumhüllung bildet;
 - die Verpackungsmittel (50) Mittel (62) zum Entladen des verpackten Produkts umfassen;
 - die Mittel (50) zum Verpacken des Produkts stromabwärts, insbesondere in Längsrichtung ausgerichtet stromabwärts, der Mittel (16) zur Herstellung des Produkts oder der Sonotrodenmittel positioniert sind.
10. Vorrichtung nach Anspruch 9, wobei
- die Mittel (70) zum Befördern von Produkten Mittel (72, 74, 76) zum Tragen entsprechender Produkte umfassen, die Teil der Mittel zur Herstellung des Produkts bilden, insbesondere Teil der Mittel (16) zum Aggregieren der Rohstoffartikel vor der jeweiligen vorbestimmten Portion und/oder Teil der Mittel, die dazu ausgestaltet sind, diesselbe Außen- oder Oberflächenschicht an der jeweiligen vorbestimmten Portion von Rohstoff haften zu lassen, insbesondere unter Bildung von Mitteln (72, 74, 76) zum Tragen von sich in Eingriff befindlichen Produkten der Aggregationssonotrodenmittel (16);
 - die Mittel (70) zum Befördern von Produkten erste Mittel (72) zum Tragen jeweiliger Produkte

und zweite Mittel (74) zum Tragen jeweiliger Produkte und möglicherweise dritte Mittel (76) zum Tragen jeweiliger Produkte, die getrennt von und/oder unabhängig voneinander jeweils an den Mitteln (16) zur Herstellung von Produkten, an den Mitteln (50) zum Verpacken von Produkten oder an den Mitteln (18) zum Zusammenbauen von Komponenten derselben Produkte beweglich sind;

- die Mittel (70) zum Befördern von Produkten erste Bewegungsmittel für entsprechende erste Mittel zum Tragen von Produkten (72) und zweite Bewegungsmittel für entsprechende zweite Mittel zum Tragen von Produkten (74) und möglicherweise dritte Bewegungsmittel für entsprechende dritte Mittel zum Tragen von Produkten (76) umfassen.

11. Vorrichtung nach Anspruch 10, wobei

- die jeweiligen Mittel (72, 74, 76) zum Tragen von Produkten der Fördermittel (70) eine Vielzahl an Sitzen (71) zum Unterbringen eines jeweiligen Produkts umfassen, insbesondere in einer geordneten Weise nach einer oder mehreren Querreihen der Sitze (71) und/oder nach einer oder mehreren Längsreihen derselben Sitze (71) positioniert sind;

- die jeweiligen Mittel (72, 74, 76) zum Tragen von Produkten der Fördermittel (70) von jeweiligen Bewegungsmitteln transportiert werden, die insbesondere getrennt von und unabhängig voneinander beweglich sind;

- die Bewegungsmittel in Form von jeweiligen endlosen, länglichen, kontinuierlichen Mitteln sind, die auf jeweiligen Betriebs- und Antriebsdrädern der kontinuierlichen Mittel transportiert werden, insbesondere in Form eines ersten und eines zweiten länglichen, kontinuierlichen Elements für entsprechende Mittel oder Platte (72, 74, 76) zum Tragen jeweiliger Produkte und sich parallel zueinander erstrecken und quer voneinander beabstandet sind, zwischen denen sich entsprechende Mittel zum Tragen von Produkten (72, 74, 76) erstrecken;

- es Mittel (48) zum Produktdurchgang von den Fördermitteln (70), insbesondere von den jeweiligen Tragmitteln (72, 74, 76) zu den Verpackungsmitteln (50) vorgesehen sind;

- die Mittel zum Produktdurchgang in Form von Mitteln (48) zum Aufnehmen von Produkten von den Fördermitteln (70) und zu deren Freigabe auf die Verpackungsmittel (50), insbesondere auf deren jeweilige Trag- und Gleitfläche sind;

- die Tragmittel (12) eine Zwischenwand (121) umfassen, sich insbesondere in Längsrichtung erstreckend, die die Seite, die mit jeweiligen Betriebsmitteln, insbesondere den Mitteln (18) zum

Zusammenbauen von Produktkomponenten, den Mitteln (16) zur Herstellung von Produkten, den Mitteln (70) zum Befördern von Produkten und den Mitteln (50) zum Verpacken derselben Produkte versehen ist, von der Seite, die mit den jeweiligen Betätigungsmitteln versehen ist, trennt;

- die jeweiligen Betriebsmittel sich, insbesondere die Mittel (18) zum Zusammenbauen von Produktkomponenten, die Mittel (16) zur Herstellung von Produkten, die Mittel (70) zum Befördern von Produkten und/oder die Mittel (50) zum Verpacken derselben Produkte, freitragend von der Zwischentrennwand (121) erstrecken;

- die Zwischenwand (121) die Mittel zum Tragen der Rolle der jeweiligen Folie (24', 30') für die jeweilige oder für beide die äußere Materialschicht bildenden Folien trennt und/oder die Mittel zum Tragen der Rolle für die Verpackungsumhüllung (50') von den Betriebsmitteln, insbesondere von den Mitteln (18) zum Zusammenbauen von Produktkomponenten, von den Mitteln (16) zur Herstellung von Produkten, von den Mitteln (70) zum Befördern von Produkten und/oder von den Mitteln (50) zum Verpacken derselben Produkte trennt und auf welcher Seite die jeweilige Folie durch entsprechende Schlitzmittel geführt wird, die in der Trennwand (121) vorgesehen sind;

- die jeweiligen Betriebsmittel, insbesondere die Mittel (18) zum Zusammenbauen von Produktkomponenten, die Mittel (16) zur Herstellung von Produkten, die Mittel (70) zum Befördern von Produkten, die Mittel zum Produktdurchgang und/oder die Mittel (50) zum Verpacken derselben Produkte eine Vielzahl an parallelen Reihen oder Linien zur Herstellung des Produkts umfassen;

- die Mittel zum Drücken des Produkts gegen eine jeweilige Folie der Verpackungsmittel (50) in Form eines entsprechenden Elements oder einer Kammeinheit (49) sind, die jeweilige an der Vorderseite offene Sitzmittel (49') zum Empfangen des Rückenteils des jeweiligen Produkts bilden, insbesondere sich quer erstreckend und aufweisend eine Vielzahl an an der Vorderseite offenen Sitzen (49') zum Empfangen entsprechender Produkte.

Revendications

1. Appareil (10) de fabrication de produits (P) pour obtenir une boisson correspondante par infusion dans un liquide respectif ; le produit respectif étant obtenu à partir d'une matière première comprenant ou formée par des particules respectives ; l'appareil comprenant des moyens de support (12) pour des

moyens (14) de fabrication de produits respectifs en partant d'une portion prédéterminée correspondant de matière première, les moyens (14) de fabrication de produits respectifs comprenant des moyens (16) pour regrouper des particules de matière première de la portion prédéterminée respective ; dans lequel :

- les moyens servant à regrouper des particules de matière première de la portion prédéterminée respective, se présentent sous la forme de moyens (16) de distribution de l'énergie ultrasonore à la portion prédéterminée de matière première ; 10
- les moyens de distribution comprennent des moyens à sonotrode (16) respectifs ; 15
- les moyens à sonotrode (16) comportent un côté respectif pour se mettre en prise avec un côté opposé de la couche extérieure correspondante du produit, ledit côté se mettant en prise étant façonné de manière appropriée pour former, dans le côté opposé du produit des poinçons de percolation préférentiels respectifs ou renforcements pour le liquide d'infusion dans et à travers le produit ; 20
- l'appareil comprend des moyens (18) d'assemblage des composants du produit ; 25
- les moyens (18) d'assemblage des composants du produit comprennent des moyens (20) dotés de sièges pour recevoir de la matière formant la couche extérieure ou superficielle du produit ; 30
- les moyens dotés de sièges pour recevoir la matière formant la couche extérieure ou superficielle comprennent une pluralité de sièges (20) positionnés d'une façon ordonnée dans une ou plusieurs rangées transversales des sièges et/ou une ou plusieurs rangées longitudinales ou périphériques des mêmes sièges ; 35
- les moyens à siège (20) sont mobiles en correspondance de postes opérationnels respectifs servant à assembler des composants de produit ; 40
- les moyens (20) dotés de sièges pour recevoir la matière formant la couche extérieure ou superficielle et/ou la portion prédéterminée respective de matière première sont portés sur une roue pivotante (22) respective dotée d'un axe transversal ou horizontal ; 45
- la roue (22) supportant les moyens à siège (20) respectifs est mobile en rotation, avec un mouvement d'alimentation alternatif et comporte des étapes d'alimentation respectives entre des postes d'assemblage correspondants et les postes suivants, qui s'alternent avec des étapes de stationnement en correspondance des postes d'assemblage respectifs et en correspondance desquels sont réalisées des opérations 50

d'assemblage respectives des composants du produit ;

- les moyens (18) d'assemblage des composants du produit comprennent des moyens (24) pour préparer ou couper, par un film (24') respectif, une feuille respective de matière pour réaliser une couche extérieure ou superficielle de produit ;
- les moyens (18) d'assemblage des composants du produit comprennent des moyens (24) d'application d'une feuille respective de matière pour réaliser une couche extérieure ou superficielle de produit aux moyens à siège (20) correspondants des mêmes moyens d'assemblage ;
- les moyens (24) d'application sont formés par des moyens servant à préparer ou à couper par un film (24') respectif ;
- les moyens (18) d'assemblage des composants de produit comprennent des moyens (26) pour façonner ou former, sur les moyens à siège (20), une feuille respective de matière pour réaliser une couche extérieure ou superficielle du produit pour former une forme ressemblant à un plateau pour recevoir la portion de matière première ;
- les moyens (26), pour façonner ou pour former une feuille respective de matière pour réaliser une couche extérieure ou superficielle du produit, sont positionnés, selon la direction d'alimentation des moyens à siège (20), en aval des moyens (24) d'application de la feuille respective sur les moyens à siège (20) ;
- les moyens (18) d'assemblage comprennent des moyens (28) de distribution de la portion prédéterminée respective de matière première vers les moyens à siège (20) sur la feuille en forme de plateau respective de matière formant la couche extérieure ou superficielle respective de produit ;
- les moyens (28) de distribution de la portion prédéterminée respective de matière première sont positionnés, selon la direction d'alimentation des moyens à siège (20), en aval, en particulier immédiatement en aval des moyens (26) pour façonner la feuille respective sur les moyens à siège (20) ;
- les moyens (18) d'assemblage des composants du produit comprennent des moyens (30) pour préparer ou couper, par un film (30') respectif, une seconde feuille respective de matière pour réaliser la couche extérieure ou superficielle de produit ;
- les moyens (18) d'assemblage des composants du produit comprennent des moyens (30) d'application de la seconde feuille de matière pour réaliser la couche extérieure ou superficielle de produit sur la première feuille, en particulier

contenant la portion prédéterminée de matière première, de préférence en condition dissoute, en particulier sur les moyens à siège (20) ;

- les moyens (30) d'application d'une seconde feuille respective de matière, pour réaliser la couche extérieure ou superficielle de produit sur les moyens à siège (20) correspondants des mêmes moyens d'assemblage, sont formés par les mêmes moyens servant à préparer ou couper par un film (30') respectif une seconde feuille respective de matière pour réaliser la couche extérieure ou superficielle de produit ;
- les moyens (30) d'application d'une seconde feuille respective de matière pour réaliser la couche extérieure ou superficielle de produit sur les moyens à siège (20) correspondants, sont positionnés, selon la direction d'alimentation des moyens à siège (20), en aval, en particulier immédiatement en aval, des moyens (28) de distribution de la portion prédéterminée respective de matière première ;
- les moyens (18) d'assemblage des composants du produit comprennent, en particulier sur les moyens à siège (20), des moyens (32) pour joindre, en particulier sceller, la seconde feuille de matière pour réaliser la couche extérieure ou superficielle de produit à la première feuille de matière pour réaliser la couche extérieure ou superficielle de produit, en particulier en correspondance du bord périphérique respectif entourant la portion prédéterminée de matière première, de préférence en condition dissoute ;
- les moyens (32), pour joindre, en particulier sceller, la seconde feuille à la première feuille de la couche extérieure ou superficielle de produit, sont positionnés selon la direction d'alimentation des moyens à siège (20), en aval, en particulier, immédiatement en aval, des moyens (30) d'application de la seconde feuille sur les moyens à siège (20) ;
- les moyens (18) d'assemblage des composants du produit comprennent des moyens (34) pour couper une portion périphérique en excès de la couche extérieure ou superficielle de produit, plus particulièrement de la seconde feuille de matière pour réaliser la couche extérieure ou superficielle de produit, en particulier sur les moyens à siège (20) ;
- les moyens (34), pour couper une portion périphérique en excès de la couche extérieure ou superficielle de produit, sont positionnés selon la direction d'alimentation des moyens à siège (20), en aval, en particulier, immédiatement en aval, des moyens (32) pour joindre ou sceller les première et seconde feuilles formant la couche extérieure ou superficielle du produit ;
- les moyens (18) d'assemblage des composants du produit comprennent des moyens (36)

pour retirer les rebuts ou portion périphérique en excès de la couche extérieure ou superficielle de produit, en particulier en correspondance des moyens à siège (20) ;

- les moyens (18) d'assemblage des composants du produit comprennent des moyens (38) pour décharger le produit des moyens à siège (20) ;
- il comprend des moyens (50) pour emballer le produit dans un emballage extérieur respectif, en particulier sous la forme d'une enveloppe extérieure respective ;

caractérisé en ce que :

- les moyens (16) de fabrication du produit sont prévus en aval des moyens (18) d'assemblage des composants du produit ;
- des moyens (70) sont prévus pour convoier les produits le long de l'appareil entre des moyens (18) d'assemblage des composants du produit et les moyens (50) d'emballage des mêmes produits ;
- les moyens (70) pour convoier les produits sont situés en correspondance des moyens (16) de regroupement ;
- les moyens (70) pour convoier les produits sont prévus sous les moyens (16) de regroupement.

2. Appareil selon la revendication 1, **caractérisé en ce que** l'énergie par vibration ou ultrasonore dans une quantité comprise entre 500 et 6 000 joules, à une fréquence comprise entre 16 000 et 35 000 hertz et pendant une durée comprise entre 0,5 et 20 secondes, est conférée à la portion prédéterminée de matière première et/ou à la couche extérieure ou superficielle respective.
3. Appareil selon la revendication 1 ou 2, **caractérisé en ce que** les moyens à sonotrode (16) peuvent être activés et désactivés respectivement dans une condition de distribution d'énergie à la portion prédéterminée de matière première et/ou à la couche extérieure ou superficielle respective, et dans une condition de repos.
4. Appareil selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les moyens de distribution d'énergie ultrasonore sont mobiles entre une position, en particulier abaissée, de distribution d'énergie à la portion respective de matière première et/ou à la couche extérieure ou superficielle respective, et une position relevée d'alimentation libre de produit.
5. Appareil selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les moyens de

distribution d'énergie ultrasonore comprennent une pluralité de sonotrodes (16) conçues pour distribuer de l'énergie par vibration à une pluralité de produits simultanément.

6. Appareil selon la revendication 5, **caractérisé en ce que** les sonotrodes (16) sont positionnées d'une façon ordonnée dans une ou plusieurs rangées transversales des sonotrodes, et/ou dans une ou plusieurs rangées longitudinales des sonotrodes.

7. Appareil selon l'une quelconque des revendications précédentes, dans lequel :

- il comprend des moyens (40) d'alimentation de la matière première ;
- les moyens (40) d'alimentation de la matière première comprennent des moyens conçus pour libérer des portions prédéterminée respectives de matière première, en particulier sur les moyens à siège (20), de préférence sur la première feuille de matière pour réaliser la couche extérieure ou superficielle de produit, plus précisément positionnée sur les moyens à siège (20) ;
- les moyens d'alimentation de matière première comprennent des moyens à trémie (40) pour charger la matière première ;
- les moyens (40) d'alimentation de matière première sont prévus au-dessus des moyens (18), en particulier avec une roue pivotante, pour assembler des composants du produit.

8. Appareil selon l'une quelconque des revendications précédentes, dans lequel :

- l'emballage extérieur ou enveloppe extérieure est formé(e) par un film correspondant de matière, en particulier par un film aluminium ;
- les moyens (50) pour emballer le produit dans un emballage extérieur ou enveloppe extérieure respectif(ve) comprennent des moyens (52) pour emballer un film (50') correspondant autour du produit respectif ;
- les moyens servant à enrouler le film autour du produit respectif comprennent des moyens (49) pour pousser le produit contre un film (50') respectif de matière correspondante pour l'emballage ou l'enveloppe, et pour pousser le produit avec le film jusqu'à l'emballage du produit dans le même film ;
- les moyens d'emballage (50), en particulier les moyens d'enveloppement (52), comprennent une surface (54) respective, en particulier fixe, pour supporter, et de préférence faire coulisser des produits ;
- les moyens (49) pour pousser les produits des moyens d'enveloppement (52) agissent sur des

produits étant supportés sur la surface de support (54) ;

- le film (50') pour fabriquer l'emballage ou l'enveloppe passe à travers, en particulier perpendiculairement, la surface de support (54), en particulier à une extrémité en amont de la même surface (54) .

9. Appareil selon la revendication 8, dans lequel

- les moyens d'emballage (50) comprennent des moyens (56) pour joindre ou sceller des extrémités opposées de rabats respectifs du film formant l'enveloppe extérieure (50') en condition d'enveloppement autour du produit respectif ;
- les moyens d'emballage (50) comprennent des moyens (58) pour joindre ou sceller réciproquement des rabats opposés et correspondants du film formant l'enveloppe extérieure (50') avec le produit respectif interposé dans ceux-ci ;
- les moyens d'emballage (50) comprennent des moyens (60) pour séparer ou couper l'emballage ou enveloppe contenant le produit à partir du film (50') respectif formant l'enveloppe extérieure ;
- les moyens d'emballage (50) comprennent des moyens (62) pour décharger le produit emballé ;
- les moyens (50) d'emballage du produit sont positionnés en aval, en particulier alignés longitudinalement en aval des moyens (16) de fabrication du produit ou des moyens à sonotrode.

10. Appareil selon la revendication 9, dans lequel :

- les moyens (70) de convoyage des produits comprennent des moyens (72, 74, 76) de support des produits correspondants, faisant partie des moyens de fabrication du produit, en particulier partie des moyens (16) de regroupement des particules de matière première avant la portion prédéterminée respective, et/ou partie des moyens conçus pour faire adhérer la même couche extérieure ou superficielle à la portion prédéterminée respective de matière première, plus particulièrement donc aux moyens de formation (72, 74, 76) pour supporter les produits engagés des moyens à sonotrode (16) de regroupement ;
- les moyens (70) de convoyage des produits comprennent des premiers moyens (72) de support des produits respectifs et des seconds moyens (74) de support des produits respectifs, et éventuellement des troisièmes moyens (76) de support des produits respectifs étant mobiles séparément et/ou indépendamment les uns des autres, respectivement en correspondance des moyens (16) de fabrication des produits, en correspondance des moyens (50) d'emballage des

produits ou en correspondance des moyens (18) d'assemblage des composants des mêmes produits ;

- les moyens (70) de convoyage des produits comprennent des premiers moyens de déplacement pour des premiers moyens correspondants de support des produits (72) et des seconds moyens de déplacement pour des seconds moyens correspondants de support des produits (74) et éventuellement des troisièmes moyens de déplacement pour des troisièmes moyens correspondants de support des produits (76).

11. Appareil selon la revendication 10, dans lequel :

- les moyens (72, 74, 76) respectifs de support des produits des moyens de convoyage (70) comprennent une pluralité de sièges (71) pour loger un produit respectif, en particulier positionnés d'une façon ordonnée selon une ou plusieurs rangées transversales des sièges (71) et/ou selon une ou plusieurs rangées longitudinales des mêmes sièges (71) ;

- les moyens (72, 74, 76) respectifs de support des produits des moyens de convoyage (70) sont portés par des moyens de déplacement respectifs, étant mobiles, en particulier séparément et indépendamment les uns des autres ;

- les moyens de déplacement se présentent sous la forme de moyens sans fin, allongés, continus respectifs portés sur des roues fonctionnelles et d'extrémité d'entraînement respectives des moyens continus, en particulier sous forme d'un premier et d'un second élément allongés continus pour des moyens correspondants ou plaque (72, 74, 76) de support des produits respectifs, et se prolongeant en étant parallèlement et transversalement espacés entre eux, entre lesquels se prolongent des moyens correspondants de support des produits (72, 74, 76) ;

- des moyens (48) sont prévus pour le passage du produit des moyens de convoyage (70), en particulier des moyens de support (72, 74, 76) respectifs, aux moyens d'emballage (50) ;

- les moyens pour le passage du produit se présentent sous la forme de moyens (48) pour saisir des produits des moyens de convoyage (70) et les libérer sur les moyens d'emballage (50), en particulier sur une surface de support et de coulisement respective de ceux-ci ;

- les moyens de support (12) comprennent une cloison intermédiaire (121) se prolongeant, en particulier, longitudinalement, qui sépare le côté pourvu des moyens opérationnels respectifs, en particulier des moyens (18) d'assemblage des composants du produit, des moyens (16) de fabrication des produits, des moyens (70) de con-

voyage des produits et des moyens (50) d'emballage des mêmes produits, du côté pourvu des moyens d'actionnement respectifs ;

- les moyens opérationnels respectifs, en particulier les moyens (18) d'assemblage des composants du produit, les moyens (16) de fabrication des produits, les moyens (70) de convoyage des produits et/ou les moyens (50) d'emballage des mêmes produits, se prolongent en porte-à-faux à partir de la cloison de séparation (121) intermédiaire ;

- la cloison intermédiaire (121) sépare les moyens de support de la bobine de film (24', 30') respectif pour la feuille respective ou les deux feuilles formant la couche extérieure de matière, et/ou sépare les moyens de support de la bobine pour l'enveloppe d'emballage (50'), des moyens opérationnels, en particulier des moyens (18) d'assemblage des composants du produit, des moyens (16) de fabrication des produits, des moyens (70) de convoyage des produits et/ou des moyens (50) d'emballage des mêmes produits, et sur le côté desquels le film respectif passe à travers des moyens à fente correspondants prévus dans la cloison de séparation (121) ;

- les moyens opérationnels respectifs, en particulier les moyens (18) d'assemblage des composants du produit, les moyens (16) de fabrication des produits, les moyens (70) de convoyage des produits, les moyens de passage du produit et/ou les moyens (50) d'emballage des mêmes produits, comprennent une pluralité de rangées parallèles ou lignes pour fabriquer le produit ;

- les moyens de poussée du produit contre un film respectif des moyens d'emballage (50) se présentent sous la forme d'un élément correspondant ou organe à peigne (49), formant des moyens à siège respectifs ouverts à l'avant (49') pour recevoir la partie arrière du produit respectif, en particulier se prolongeant transversalement et comportant une pluralité de sièges (49') ouverts à l'avant pour recevoir des produits correspondants.

FIG. 1

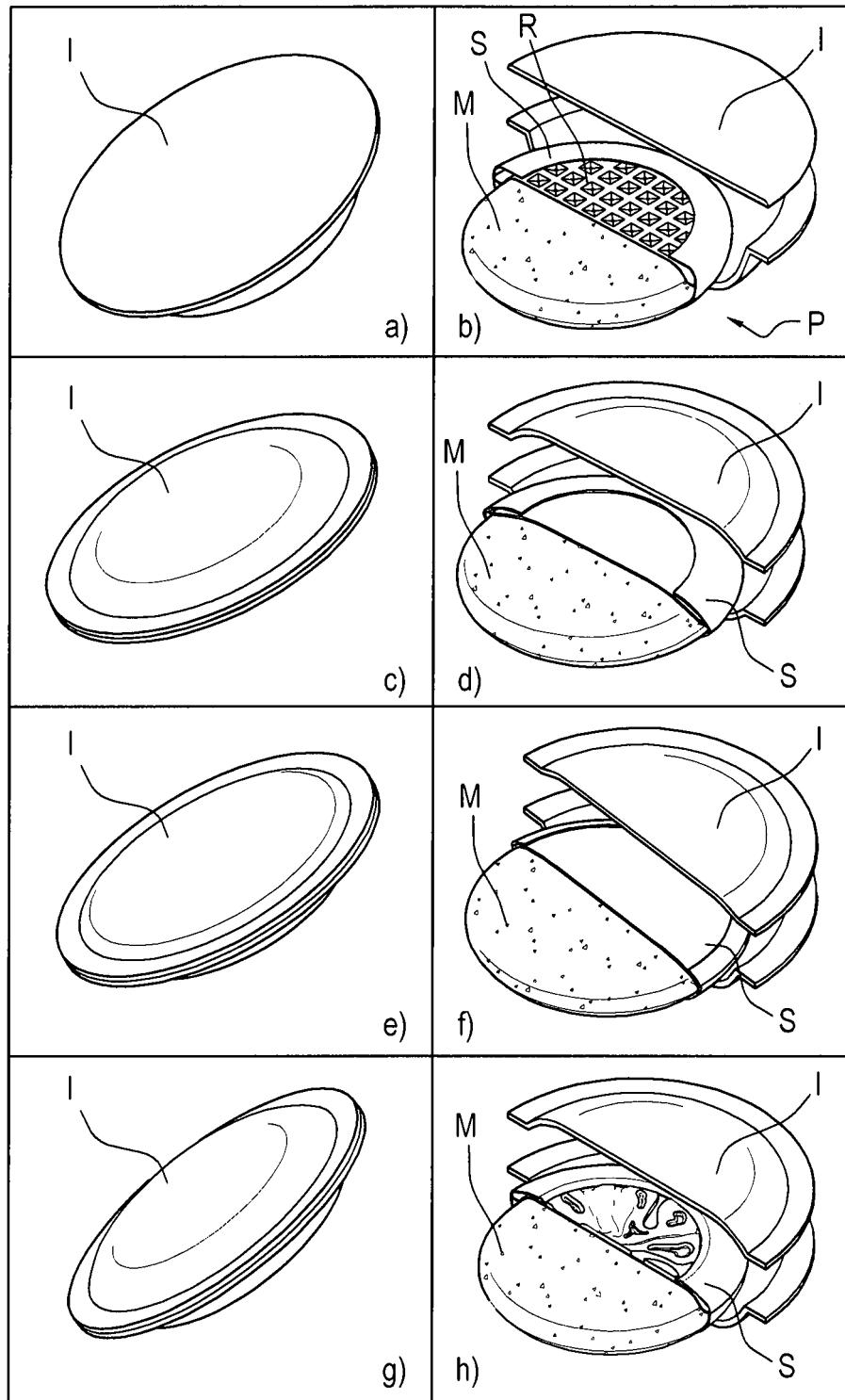
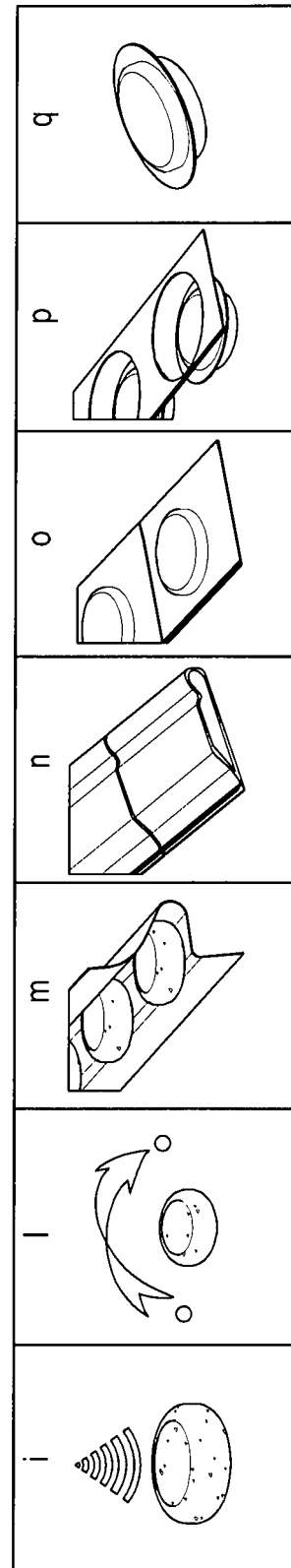
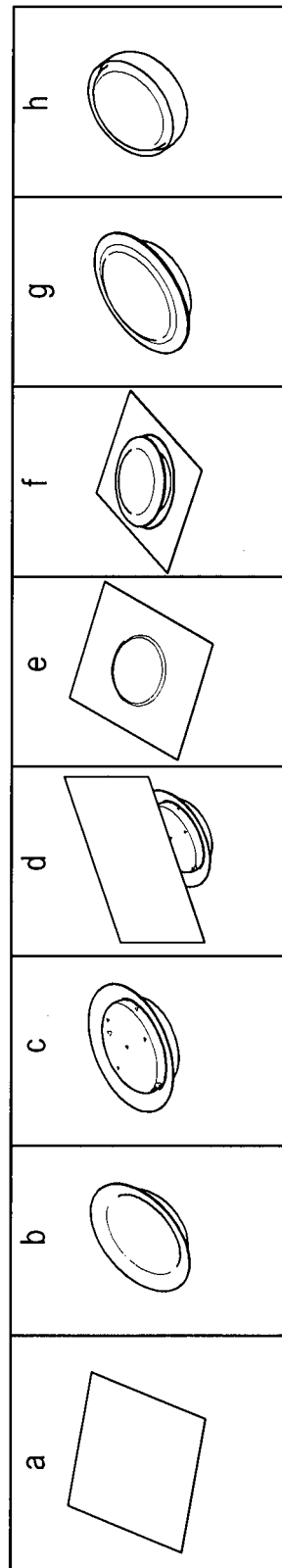


FIG. 2



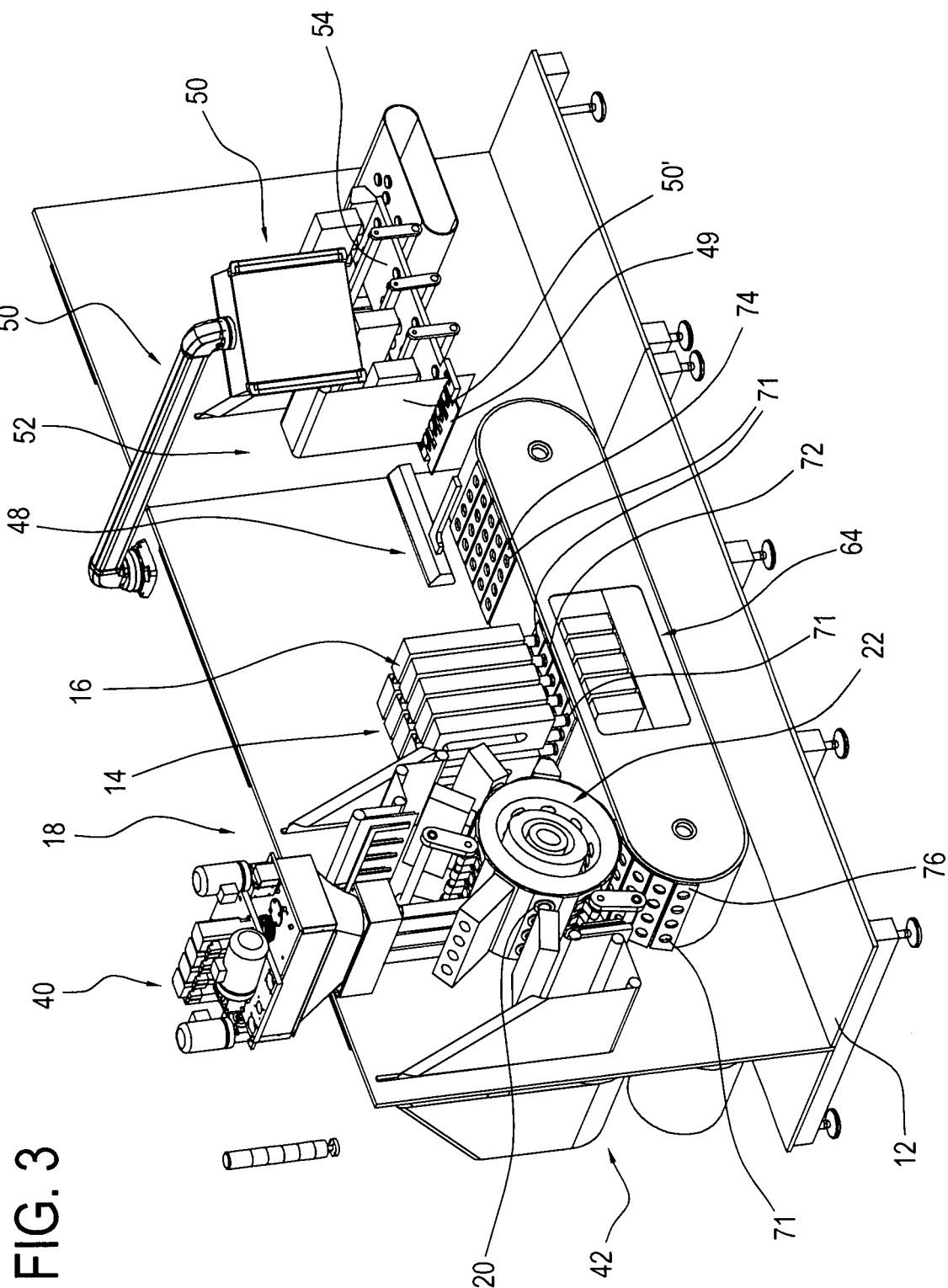


FIG. 4

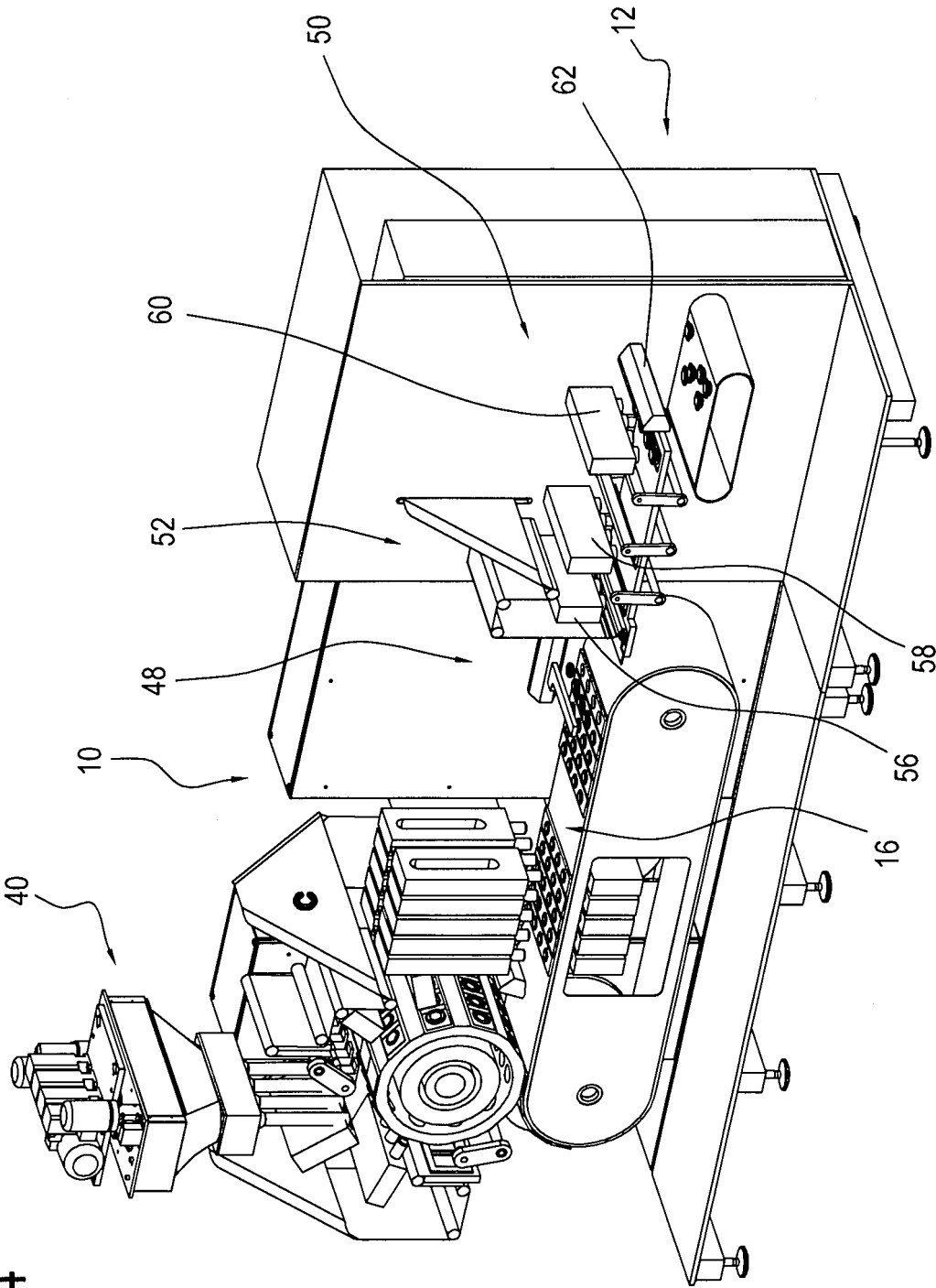


FIG. 5

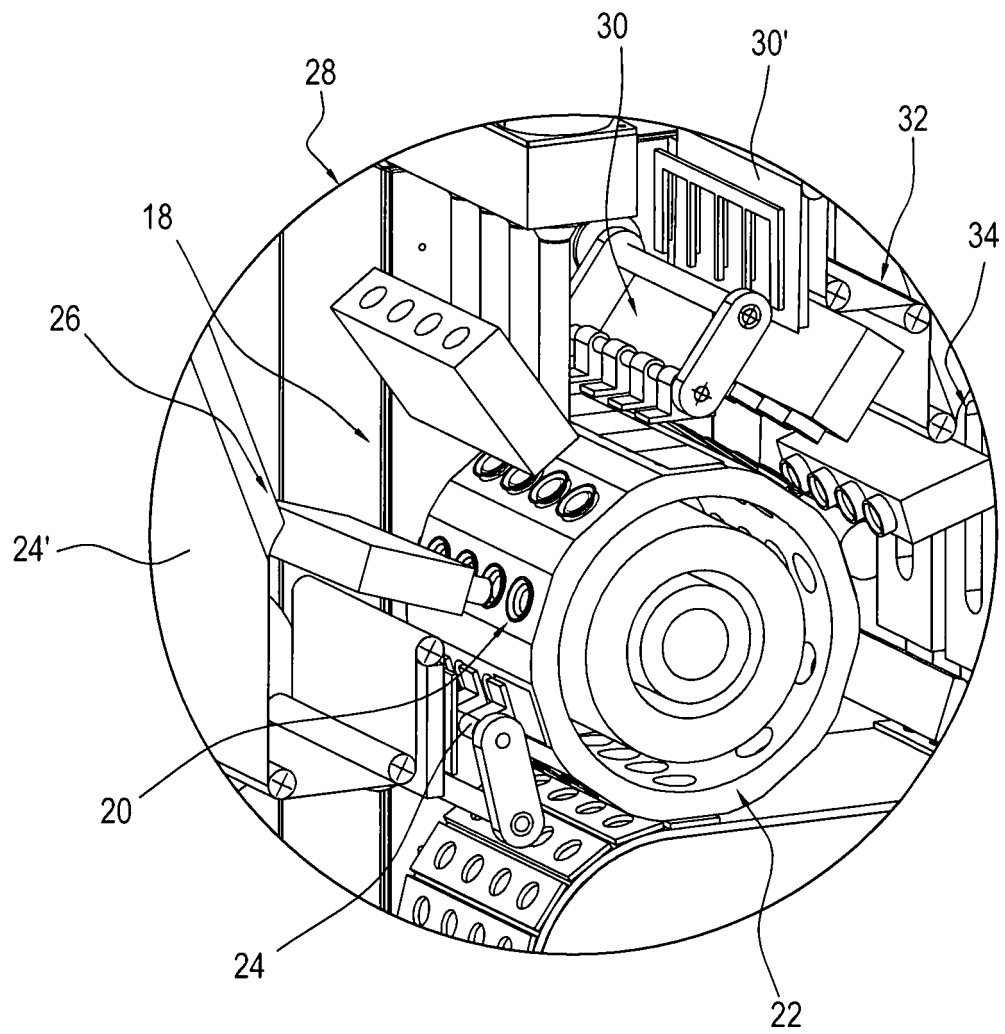


FIG. 6

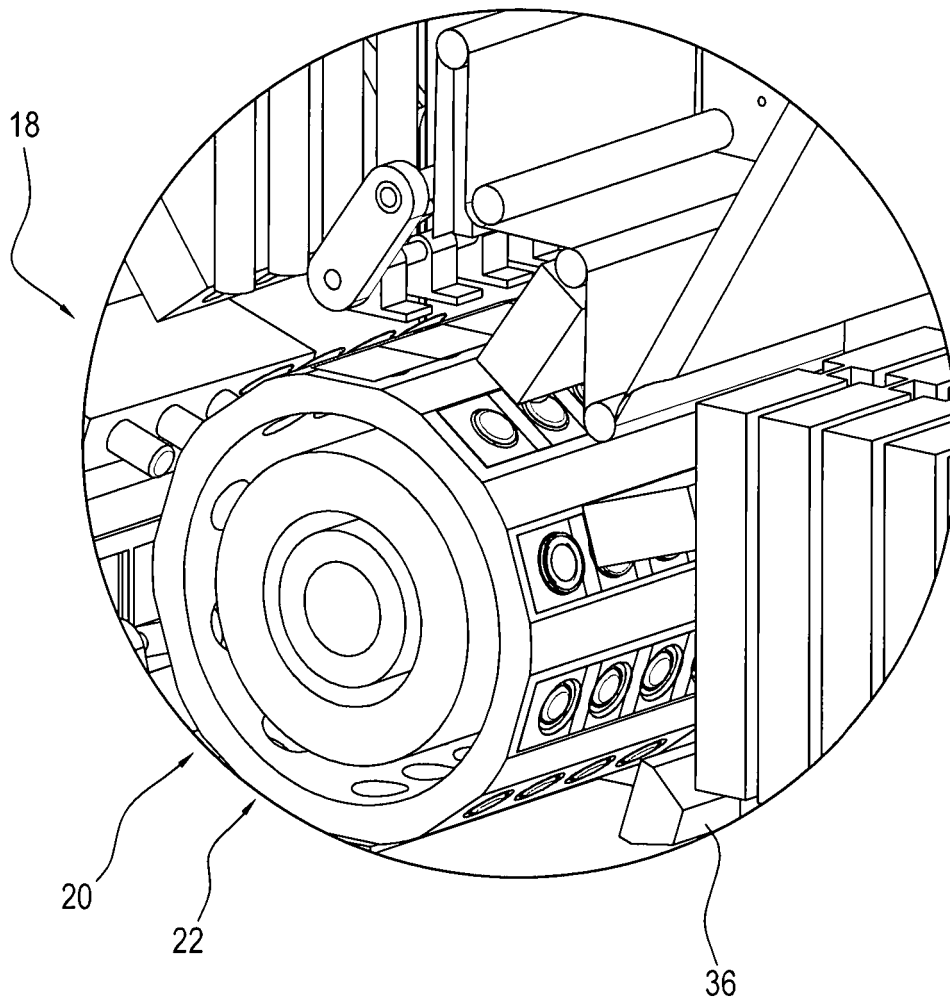


FIG. 7

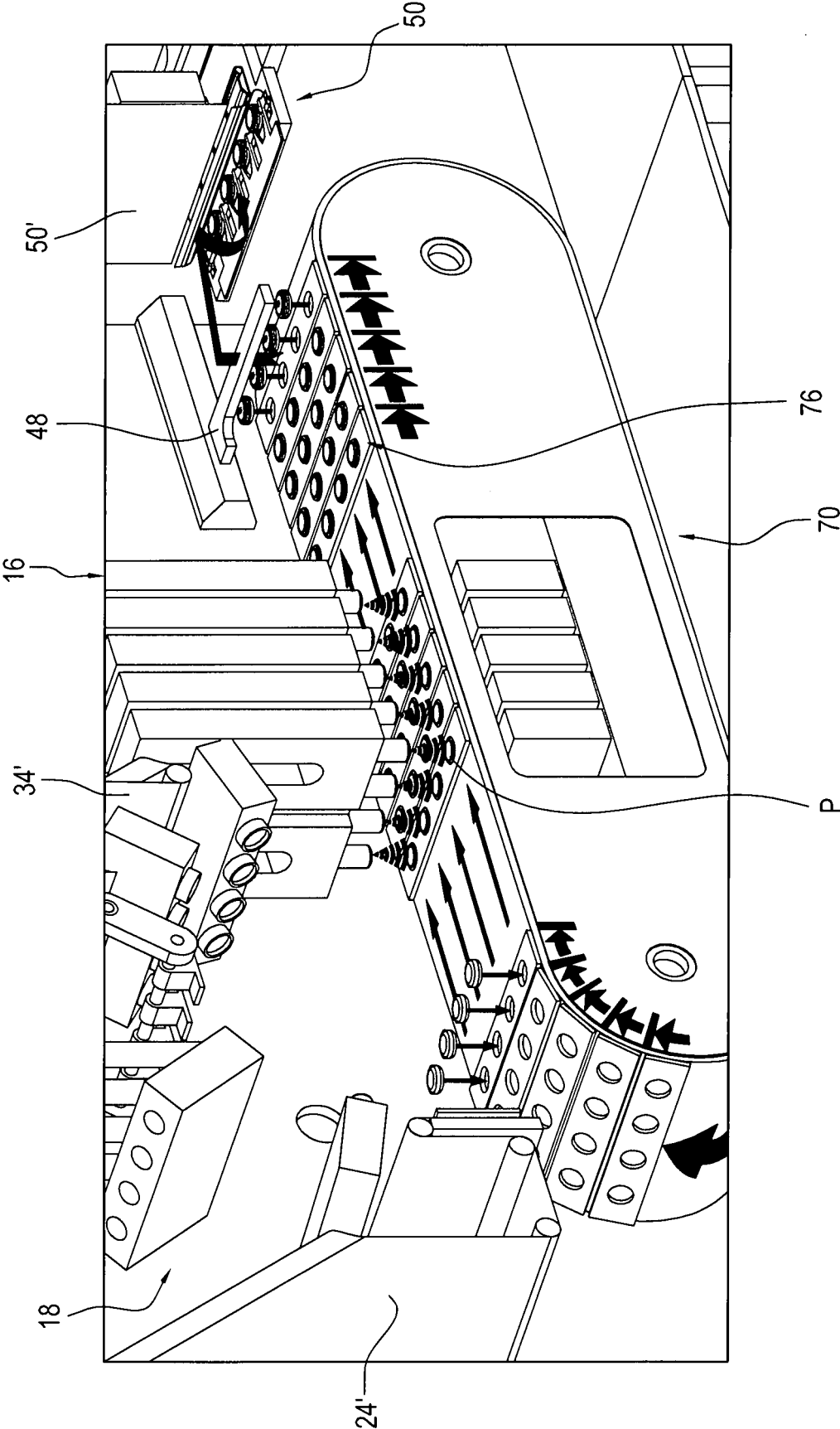
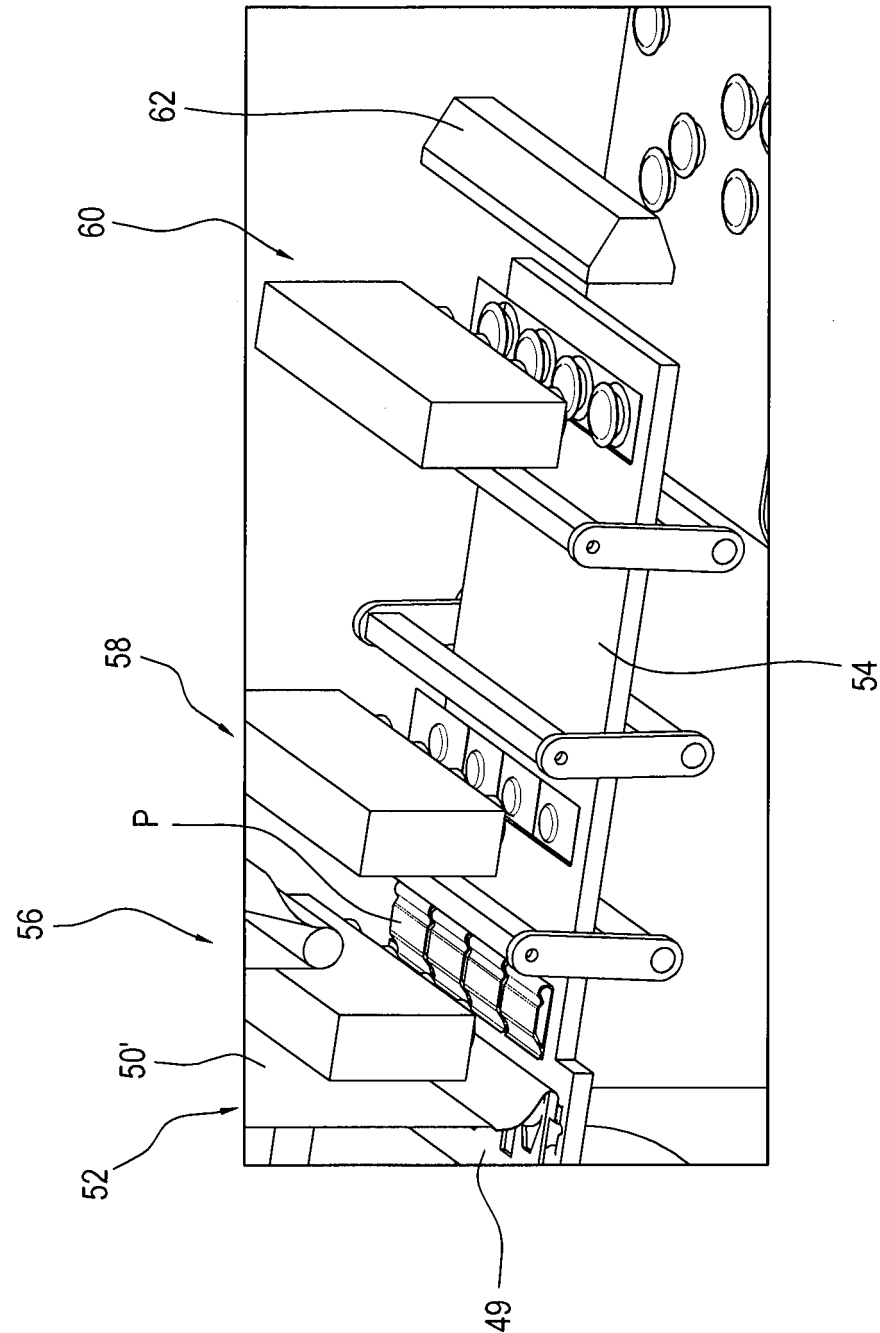


FIG. 8



REFERENCES CITED IN THE DESCRIPTION

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