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(54) APPARATUS FOR PROCESSING FOOD ARTICLES SUCH AS POTATOES

(57) An apparatus for processing of a food object (40) such as a potato, said apparatus (1) comprising
a support part (2) for supporting said food object (40) and
- a cutting part (4) comprising a plurality of cutting blades (20).

The plurality of cutting blades (20) are positioned in respective planes by said cutting part (4), wherein said planes extend along a first axis (A) of the cutting part (4). At least one of the plurality of cutting blades (20) is positioned forward of at least one other of said plurality of cutting blades (20) along said first axis (A). Further, the support part (2) and the cutting part (4) are configured for being movable in relation to each other in the direction of said first axis (A) and a distance is defined between the plurality of cutting blades (20) and an opposing part of the support part (2).

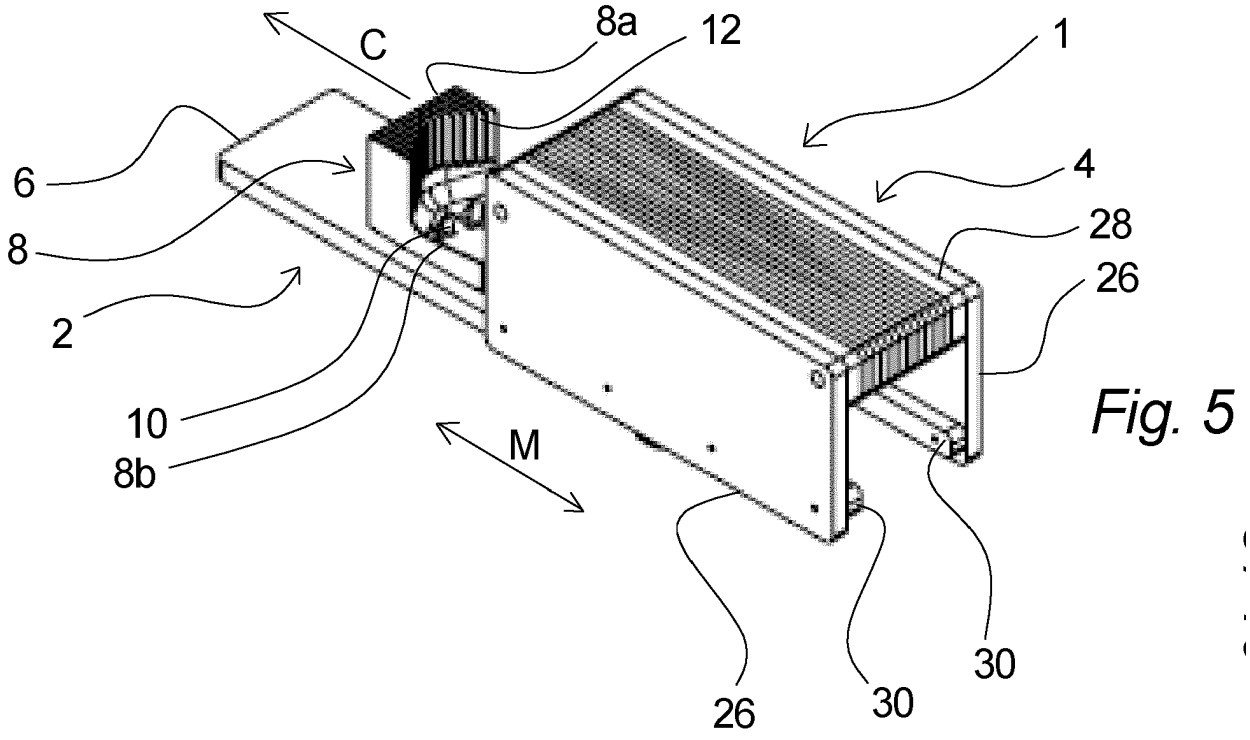

Fig. 5

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Description

Field of the invention

[0001] The invention relates to an apparatus for processing of food objects such as potatoes, which processing includes cutting or slicing of food objects, e.g. potatoes in such a manner that a plurality of cuts are being made in each food object, e.g. each potato, which cuts are being made from one side of the food object, e.g. potato without going entirely through the food object, e.g. a potato. The invention relates to such an apparatus for processing of a food object such as a potato, which apparatus comprises a support part for supporting the food object and a cutting part comprising a plurality of cutting blades.

[0002] In the following reference will be made in particular to potatoes that are being processed by use of an apparatus according to the invention, but it will be understood that the apparatus may be used in connection with other food objects such as e.g. other kinds of vegetables, root crop or vegetables and the like, where it may be desirable to perform a similar cutting. In this connection it is noted that for the purpose of this application, the potato may be referred to as a vegetable.

Background of the invention

[0003] Potatoes, which are cut or sliced transversely with a plurality of parallel cuts from one side of the potato, but not entirely through the potato, and which are baked subsequently, are well-known under the name of "Hasselback (or Hasselbach) Potatoes" within the field of e.g. cooking by professional cooks as well as within the traditional non-professional field such as household cooking, among amateur gourmets, etc.

[0004] When preparing these potatoes, they are usually prepared manually, e.g. by peeling suitably sized potatoes, placing them one by one on e.g. a cutting board with a side part downwards and by cutting crosswise cuts or slices in the upper side of the potato with a suitable sharp knife, which cuts may be essentially parallel, with a suitable distance to each other and ending a suitable distance from the downward side of the potato, i.e. the side facing the cutting board.

[0005] As it will be understood, this may be a time consuming job and furthermore, especially when in haste and/or where an inexperienced person is handling the job, there is a risk that the potato is being cut entirely through and/or that the cuts are very different, e.g. ending at very different distances from the downwards side of the potato, which is undesirable. In order to avoid this, various measures may be used, such as e.g. placing an object having the desired thickness next to the potato and possibly on both sides in order to stop the downwards movement of the knife, e.g. a suitable piece of wooden kitchen utensil or the like. However, this may further complicate the preparation of the potatoes, especially when a relatively large number of potatoes need to be prepared or processed.

[0006] An example of a manually operated kitchen utensil for partially cutting vegetables is disclosed in EP 2 277 673 A1. This kitchen utensil has a plurality of parallel blades, which by means of a movable support can be moved down towards a vegetable placed in a cavity on a support, whereby each of the blades makes a cut in the vegetable. As it will be seen, such a kitchen utensil is relatively large and comprises a plurality of blades that are used simultaneously. Thus, a relatively complicated construction is disclosed, which further seems to suffer from a lack of user-friendliness, ease of handling, etc. Furthermore, the use of a plurality of parallel blades simultaneously requires some force to be exerted by the user, tends to put excessive pressure on the potato and may lead to the blades getting stuck in the potato.

[0007] A further example of a manually operated cutting utensil for partially cutting vegetables, e.g. Hasselback potatoes, is disclosed in DK 2014 00186 U3. This cutting utensil comprises a base part, e.g. a cutting board with a recess for partly receiving a vegetable, e.g. a potato, and a cutting part, which cutting part comprises a plurality of parallel side-by-side arranged cutting blades. The cutting part is connected to the base part in such a manner that it can be e.g. rotated from a position above the e.g. potato downwardly to cut partly through the e.g. potato. Thus, the use of a plurality of parallel blades, which simultaneously cut into the e.g. potato, means that a considerable amount of force must be exerted by the user, which further tends to put excessive pressure on the e.g. potato and may lead to the blades getting stuck in the e.g. potato.

[0008] Furthermore, EP 3 047 945 A1 discloses a system and a method for cutting Hasselback food items, wherein a conveyor is used for moving food items along a path, where a cutting device is positioned above the conveyor. The power-driven cutting device includes an array of four or more parallel side-by-side arranged cutting blades, where the cutting device is configured to move from a position above a potato downwardly and partly through the potato to form cuts in the potato and then upwardly again. Thus, this power-driven system involves a relatively complicated construction utilizing conveyor means, power drive means for the cutting device such as e.g. hydraulic or pneumatic means, etc.

[0009] Thus, there is a need to improve the e.g. cutting of potatoes for uses such as "Hasselback (or Hasselbach) Potatoes" and to provide an improved apparatus for such uses.

[0010] Further, there is a need for providing improved measures for processing potatoes for such purposes, which allows a relatively quick and relatively simple processing to be performed, which furthermore reduces the risk of cutting entirely through the potatoes and which facilitates the cuttings being made with great regularity, e.g. with even spacing, etc.

[0011] Furthermore, there is a need for an apparatus

for processing vegetables, e.g. potatoes in the described manner, which apparatus may facilitate a user-friendly processing speed of e.g. the potatoes and may serve as an efficient tool for both professional and non-professional persons.

[0012] Also, it is an object of the invention to provide an apparatus for such a cutting of food objects such as potatoes, which facilitates an easy and expedient processing, which apparatus is relatively uncomplicated, while still allowing the cutting to be performed with the desired precision and effortlessness.

[0013] These and other objects are achieved by the invention as explained in further detail in the following.

Summary of the invention

[0014] The invention relates to an apparatus for processing of food objects such as potatoes, said apparatus comprising

- a support part for supporting said food object and
- a cutting part comprising a plurality of cutting blades, said apparatus being characterized in that
- said plurality of cutting blades are positioned in respective planes by said cutting part, said planes extending along a first axis of said cutting part, wherein at least one of said plurality of cutting blades is positioned forward of at least one other of said plurality of cutting blades along said first axis, and in that
- said support part and said cutting part are configured for being movable in relation to each other in the direction of said first axis, and
- wherein a distance is defined between said plurality of cutting blades and an opposing part of said support part.

[0015] Hereby, it is achieved that the cutting operation can be performed in a relatively uncomplicated manner, i.e. by simply positioning the food object such as a potato on the support part and by moving the cutting part along the first axis in relation to the support part, whereby parallel cuts are being made in the food object, e.g. the potato. Since a distance is defined between the plurality of cutting blades and an opposing part of the support part, upon which the e.g. potato is placed, it is ensured that a part of the e.g. potato will not be cut by any of the cutting blades.

[0016] By having at least one of the plurality of cutting blades being positioned forward of at least one other of the plurality of cutting blades along the first axis, it is achieved that the force, which the user must apply, is lessened, since e.g. the cutting is not initiated and performed by a plurality of cutting blades at the same time. Furthermore, since the cutting of the e.g. potato is initiated by the at least one forward positioned cutting blade, the e.g. potato will to some extent be further stabilized in its position by this first cut, which will facilitate the further cutting by the other cutting blades as these contact the e.g. potato.

[0017] Even further, it is hereby achieved that the processing can easily be performed manually.

[0018] It is noted that in connection with the present invention terms such as horizontal and vertical are being used in explaining and/or defining certain features. It will be understood that such terms are based on a position and orientation of the apparatus according to the invention in its normal position with the support part placed on a horizontal work plane such as e.g. a kitchen table.

[0019] According to an embodiment of the invention, said support part for supporting said food object may comprise an object carrier for positioning the food object, which object carrier may comprise a horizontal carrier part and a vertical carrier part.

[0020] Hereby, it is achieved that the food object, e.g. a potato, can be positioned in an advantageous manner for the cutting to be performed, whereby primarily the vertical carrier part ensures that the e.g. potato is held in its position, while the cutting blades cut through it in the longitudinal direction of the cutting apparatus and thus exert forces on the e.g. potato in the cutting direction.

[0021] According to an embodiment of the invention, said object carrier for positioning the food object may comprise at least one holding pin.

[0022] Hereby, it is achieved that the food object, e.g. a potato, can be positioned and held on the object carrier securely, when for example the user manually places the e.g. potato and proceeds to the actual cutting. The e.g. potato is just placed in the right position on the object carrier and is gently pressed down on the at least one holding pin.

[0023] According to an embodiment of the invention, said distance defined between said plurality of cutting blades and an opposing part of said support part may be a distance in a vertical direction between a lower part of said plurality of cutting blades and said horizontal carrier part.

[0024] Hereby, the required or desired distance to be free from cuts is defined in an advantageously simple manner by e.g. the lowest part of the horizontal carrier part in relation to the cutting blades.

[0025] The distance in a vertical direction between a lower part of said plurality of cutting blades and said horizontal carrier part may be in the range from e.g. 10 mm to 30 mm and may for example be around 20 mm, although it will be understood that other e.g. ranges may be utilized.

[0026] According to an embodiment of the invention, said vertical carrier part may comprise a plurality of slots, which correspond to the position of the plurality of cutting blades, when passing the object carrier.

[0027] Hereby, it is achieved that the vertical carrier part may extend a distance in the vertical direction which may be optimal in withholding the food object, e.g. a potato, in response to the cutting forces exerted by the cutting blades. For example, the vertical carrier part may extend a distance corresponding to half the height of the

food object, e.g. the potato, or more, while still allowing the cutting blades to pass the vertical carrier part in the cutting direction.

[0028] According to an embodiment of the invention, said cutting part may comprise side walls and an upper part, which upper part is configured to carry said plurality of cutting blades extending downwardly in said respective planes.

[0029] Hereby, an expedient manner of configuring the e.g. frame of the cutting part is provided. Further, it is achieved that the sidewalls hereby may serve as protection for the cutting blades, e.g. protecting the cutting blades from being damaged, bent, etc., when the cutting part is handled, etc. and as protection for the user, e.g. in order to prohibit that the user is cut by the cutting blades. It is noted that even though the term wall is used in connection with the side wall, the wall is not necessarily a continuous, e.g. plate shaped body, but may comprise openings, etc. and may comprise e.g. a lattice or the like for providing the function of extending downwardly from the upper part.

[0030] According to an embodiment of the invention, said plurality of cutting blades may be extending downwardly in said respective planes, which are essentially parallel with each other.

[0031] Hereby, the parallel cuts in an upper part of the food object, e.g. a potato, can be made in a straightforward and expedient manner.

[0032] According to an embodiment of the invention, said plurality of cutting blades may be positioned in steps along said first axis, e.g. wherein one, two or more of said plurality of cutting blades may be positioned at each step.

[0033] Hereby, the cutting blades can be arranged in a suitable manner, whereby the cutting blades are spread along the first axis. According to the invention, at least one of the plurality of cutting blades is positioned forward of at least one other of the plurality of cutting blades along the first axis, and by this embodiment a further spreading is achieved. Thus, the force, which the user must apply, is lessened even more, since e.g. the cutting is initiated and performed by cutting blades in steps, e.g. whereby it will be understood that the actual number of cutting blades that at one point in time is being pushed through a food object, e.g. a potato, will be reduced. The length between steps and the configuration in general can be arranged such that at any time only two, three, four, five, etc. cutting blades will pass through the e.g. potato and that thus only a corresponding force has to be applied by the user. Hence, the cutting apparatus can thus be used in an easy and comfortable manner, without requiring excessive force.

[0034] Hereby, it is furthermore avoided that a relatively large number of cutting blades simultaneously are being pushed through a food object, e.g. a potato, which would require a relatively large pushing force due to the number of cutting blades alone, but furthermore would require extra force due to the thickness of the cutting blades that would tend to compress the food object material between the cutting blades, as it is experienced with some of the prior art techniques.

[0035] According to an embodiment of the invention, said steps along said first axis may be equidistantly arranged.

[0036] Hereby, a straightforward arrangement is achieved, which in general will be suitable for a wide variety of food objects. However, it will be understood that other configurations are possible.

[0037] According to an embodiment, the distance between two consecutive cutting blade steps may be in a range from e.g. 10 mm to 40 mm, in another embodiment in a range from 15 mm to 30 mm and in a particular embodiment around 20 mm.

[0038] According to an embodiment of the invention, said plurality of cutting blades may each comprise a cutting blade edge and/or a cutting blade tip and said plurality of cutting blades may be positioned, based on the respective positions of said cutting blade edges and/or said cutting blade tips.

[0039] It is noted that the cutting blades may essentially be identical, e.g. as regards shape and size. Thus, all may be designed with an inclined cutting blade edge that may have the same inclination, e.g. around 45° in relation to a vertical direction, and all may have the same dimension in the vertical direction, whereby they will all cut to the same horizontal level through a food object, e.g. a potato. Other variations are possible, e.g. with a lover or steeper inclination and possible with a cutting blade edge, which is essentially vertical.

[0040] When the cutting blades are essentially identical, the respective steps may be based on e.g. the position of the cutting blade tip of each of the blades or the e.g. upper position of the respective cutting blade edges. Other options are possible, as it will be understood.

[0041] According to an embodiment of the invention, said plurality of cutting blades may be positioned such along said first axis of said cutting part that cutting blades at each outer side of the cutting part are positioned forward of the remaining cutting blades along said first axis.

[0042] Hereby, it is achieved that the cutting blades positioned at each side of the cutting part reach the food object, e.g. the potato, as the first ones, which may be advantageous in relation to the stable position of the e.g. potato during the cutting, since the e.g. potato in this manner at each side (or end) will be pushed towards the object carrier's vertical carrier part and thus will be held stably, when the rest of the cutting blades reaches the e.g. potato and start to cut into it.

[0043] According to an embodiment of the invention, said plurality of cutting blades may be positioned such along said first axis of said cutting part that one or more cutting blades at a middle region of the cutting part is/are positioned forward of the remaining cutting blades along said first axis.

[0044] Hereby, a configuration is provided which may be preferable in connection with various food objects.

[0045] As stated above, the plurality of cutting blades are positioned in respective planes by the cutting part, wherein the planes extend along a first axis of the cutting part. According to an embodiment, the planes and thus the distance between the cutting blades in the transverse direction may be equidistantly arranged, although other configurations are possible. The distance between the planes and thus the distance between the cutting blades in the transverse direction may be in a range from 2 mm to 8 mm, alternatively in a range from 4 mm to 6 mm and may be around 5 mm.

[0046] According to an embodiment of the invention, said support part and said cutting part may be configured for being movable in relation to each other in the direction of said first axis in a sliding manner and wherein said support part and/or said cutting part are/is configured with one or more guide lists or the like.

[0047] Hereby, the support part and the cutting part may be designed in an advantageously simple manner to be movable in relation to each other, i.e. by the cutting part simply sliding on and along the support part. Hereby, the two parts can easily be removed from each other, which furthermore facilitates an efficient cleaning of the parts of the apparatus.

[0048] It is noted that other manners of designing the support part and the cutting part to be slideable in relation to each other are possible, e.g. by cutting or moulding the lower parts of the walls of the cutting part to have a sectional form that corresponds to e.g. the edges or possible tracks or the like on the support part. Other options are possible, as it will be obvious to a skilled person.

[0049] According to an embodiment of the invention, said support part for supporting said food object may comprise fixing means for fixing said support part, in particular during use.

[0050] Hereby, the apparatus may be made ready for use and used quickly and relatively easily, e.g. by just placing it on a table with e.g. the fixing means such as a list or the like abutting the edge of the table. Thus, when using the apparatus to cut a potato into a Hasselback potato, the potato is placed on the support part and the cutting part is pushed with one hand in the cutting direction and possibly downwards as well. The fixing means will hold the support part in its position on the table, thus making it in principle unnecessary to grip the support part with the other hand.

[0051] It is furthermore noted that the apparatus is configured in such a manner, e.g. being configured with a support part and a cutting part that are separate units, whereby an effective and easy cleaning is facilitated, e.g. by putting the two parts in a dishwasher.

The figures

[0052] The invention will be explained in further detail below with reference to the figures of which

Fig. 1 shows an example of an apparatus according to an embodiment of the invention in a perspective view, ready to receive a food object,

Fig. 2 shows the apparatus from fig. 1, but in a scenario where a processing of a food object has been performed,

Fig. 3 is a sideview of an example of an apparatus according to an embodiment of the invention with one sidewall partially removed to show inner elements,

Fig. 4 is a sideview, corresponding to fig. 3, but shown in a scenario where a processing of a (non-shown) food object is being performed,

Figs. 5 and 6 are perspective views corresponding to figs. 1 and 2 of an apparatus according to an embodiment of the invention, seen from a different angle,

Fig. 7 is a sideview of an apparatus according to an embodiment of the invention, shown in a scenario with a food object positioned in the apparatus,

Fig. 8 is an apparatus according to an embodiment of the invention, seen from above and in a scenario with a food object positioned in the apparatus,

Fig. 9 is an endview of an apparatus according to an embodiment of the invention,

Fig. 10 is an enhanced view of a portion of the apparatus as shown in fig. 9,

Figs 11a-e shows various examples of the cutting blade configuration acccording to embodiments of the invention,

Fig 12 shows a further example of a cutting part, seen in a perspective view,

Fig. 13 shows a support part corresponding to the cutting part of fig. 12, seen in a perspective view,

Fig. 14 shows the support part of fig. 13 with a food object positioned on the object carrier,

Fig. 15 shows an example of an upper part of the cutting part shown in fig. 12, shown upside down, but with sidewalls removed,

Fig. 16 shows the cutting part and the support part as shown in figs. 12-15 assembled and ready to perform a processing of a food object,

Fig. 17 shows the apparatus of fig. 16, seen from the side in a schematic view with inner parts indicated with dotted lines and with a food object positioned prior to cutting,

Fig. 18 shows the apparatus of fig. 17, but in a scenario where the food object is being processed,

Fig. 19 is an endview of the apparatus as

shown in fig. 18, seen in the cutting direction, and

Fig. 20 is an endview of the apparatus as shown in fig. 18, corresponding to fig. 19, but seen in the opposite direction, i.e. against the cutting direction.

Detailed description

[0053] An example of an apparatus 1 according to an embodiment of the invention is shown in a perspective view in figs. 1 and 2. In fig. 1 it is illustrated that the apparatus is arranged to receive a food object 40, e.g. a potato, to be cut, where in fig. 1 the food object 40 is shown lying next to the apparatus. In fig. 2 it is illustrated that the apparatus 1 has been operated to perform a processing, e.g. a cutting of a food object, which in fig. 2 is still inside the apparatus. However, in fig. 2 an example of such a food object 40, e.g. a potato that has been processed by use of the apparatus 1 to comprise a number of essentially parallel cuts 42 is shown lying next to the apparatus 1.

[0054] As shown, the apparatus 1 generally comprises a support part 2 and a cutting part 4, which are configured to be movable in relation to each other along a first axis A, which in the shown example is an axis in the longitudinal direction of the apparatus 1. As further illustrated with a double arrow M, the support part 2 and the cutting part 4 may preferably be movable back and forth in relation to each other. The support part 2 comprises a base part 6, which in general is a flat body, upon which an object carrier 8 are arranged in order to position the food object 40, e.g. a potato as it later on will be explained. The cutting part 4 comprises in general two sidewalls 26, which are connected by an upper part 28, which as it will be explained later on serves for holding cutting blades or the like. Near the lower parts of the sidewalls 26 and on the inner side of these, guide parts 30 are arranged in such a manner that the lower parts of the sidewalls 26 can reach over the base part 6, while the guide parts 30 are resting on the base part 6. Thus, the cutting part 4 can move, e.g. slide back and forth along the support part 2 as indicated with the double arrow M. When sliding along the support part 2, the cutting part 4 passes the object carrier 8, such that when the cutting part 4 is sliding in the cutting direction C, a food object can be processed as it will be explained in greater detail in the following.

[0055] Fig. 3 is a sideview of an example of an apparatus 1 according to an embodiment of the invention with one sidewall 26 partially removed to show inner elements of the apparatus 1. In fig. 3, the support part 2 and the cutting part 4 are shown in a "loading" position, where it is possible to place an e.g. potato (not shown) on the object carrier 8. The object carrier 8 is here shown comprising a vertical carrier part 8a and a horizontal carrier part 8b, where the vertical carrier part 8a is located next to the horizontal carrier part 8b to support the e.g. potato horizontally as well as vertically. Thus, an e.g. potato that is being cut when the cutting part 4 is moved in the cutting direction C, i.e. the direction to the left as shown on fig. 3, will be supported in the longitudinal direction by the vertical carrier part 8a to withstand the force exerted on it by the user pushing the cutting part 4 in the cutting direction C. Further, the horizontal carrier part 8b will position an e.g. potato in the vertical direction and will as it later will be explained be instrumental in defining a part of the e.g. potato that will not be cut.

[0056] Furthermore, in fig. 3 it is shown that the object carrier 8 may have one or more holding pins 10, spikes or the like, which are for example reaching upwards from the object carrier in the longitudinal direction 8b. These holding pins 10, spikes or the like may serve in positioning an e.g. potato, which may be pushed down onto the holding pins 10, spikes or the like.

[0057] As shown, the object carrier 8 may be shaped in such a manner that a rounded food object such as e.g. a potato may in a natural manner be accommodated with a part or parts of the food object leaning against the vertical carrier part 8a.

[0058] In fig. 3 it is further shown that the cutting blades 20 are supported from the upper part 28, e.g. each with an upper part of the cutting blade embedded in the upper part 28. Further, as indicated, the cutting blades 20 may be essentially triangular shaped with a cutting blade edge 24 essentially facing in the cutting direction C and a cutting blade tip 22, which may be the lower part of each of the cutting blades 20. As shown, the cutting blade edge 24 may be inclined to facilitate the cutting. It will be understood that the inclination of the cutting blade edge 24 in relation to a vertical direction may vary and that it may be designed in consideration of the characteristics of the food object, e.g. a large inclination when processing a relatively hard food object and an smaller inclination when the food object involved is relatively soft. As indicated in fig. 3, the inclination may be around 45°.

[0059] Even further, it is shown in fig. 3 that at least one of the cutting blades 20 is placed with spacing to the others in the cutting direction C.

[0060] Furthermore, it is shown in fig 3 that the support part 2 is configured with fixing means 14 for assisting in holding the apparatus 1 on e.g. a kitchen table or the like (not shown) during use. As shown, the fixing means 14 may comprise a downward reaching part at the right end of the base part 6 as shown in fig. 3, e.g. a list or the like which may serve to abut against an edge of e.g. a kitchen table, on which the apparatus 1 is placed. Thus, during use and when the cutting part 4 is pushed in the cutting direction C, the base part 6 and thus the support part 2 will be kept in the initial position. The fixing means 14 may be configured in other manners, e.g. as clamping means, etc.

[0061] Fig. 4 is a side view, corresponding to fig. 3, but with the apparatus 1 shown in a scenario where a processing of a (non-shown) food object is being performed, e.g. with the cutting part 4 being moved in the cutting direction C in relation to the support part 2, where-

by the cutting blades 20 one or more at the time is/are cutting into the food object, e.g. in a stepwise manner as at least some of the cutting blades are arranged at different positions in the longitudinal direction and in the cutting direction C. As shown, the apparatus 1 is configured in such a manner that a distance D is defined between the lower parts of the cutting blades 20, e.g. the cutting blade edges 22, and a lower supporting surface of the object carrier 8, e.g. a part of the horizontal carrier part 8b, whereby it is ensured that a part of the food object 40, e.g. a potato, is not being cut through. As further indicated, the holding pins 10, spikes or the like may be arranged such that the top of these will be at a lower level than the lower parts of the cutting blades 20, e.g. the cutting blade edges 22. However, it will be understood that this may not be necessary in case the cutting blades 20 and the holding pins 10, spikes or the like are placed at different positions along a second axis in the transverse direction of the apparatus 1 (i.e. in a direction perpendicular to the first axis A).

[0062] The distance D in the vertical direction between a lower part of the plurality of cutting blades 20 and the lower supporting surface of the object carrier 8, e.g. a part of the horizontal carrier part 8b, may be in the range from e.g. 10 mm to 30 mm and may for example be around 20 mm, although it will be understood that other e.g. ranges may be utilized.

[0063] Furthermore, it will be understood from fig. 4 that the vertical carrier part 8a may be configured with slots or the like, which allow the cutting blades 20 to pass when being moved in the cutting direction C as well as back in the opposite direction.

[0064] In figs. 5 and 6 the apparatus 1 according to an embodiment of the invention is shown in perspective views corresponding to figs. 1 and 2, but seen from a different angle. Thus, the same reference numbers as used in connection with figs. 1 and 2 are used for the same features. In fig. 5, the apparatus is shown in a "loading" position, where a food object such as a potato (not shown) can be placed in or on the object carrier 8 and where the food object can be pushed down onto the holding pins 10. Hereafter, the cutting part 4 can be moved, e.g. pushed manually in the cutting direction C, whereby the food object will be cut by the cutting blades (not shown in figs. 5 and 6).

[0065] In fig. 6 it is shown that the cutting part 4 has been moved a certain distance, whereby the processing of the food object has been initiated. When moved further in the cutting direction C, the processing, e.g. the cutting will be completed and the processed food object, e.g. a cut potato, can be removed when the cutting part 4 has been moved sufficiently in the cutting direction C or possibly when the cutting part 4 has been lifted up from the support part 2. The cutting part 4 can hereafter be moved, e.g. slid back to the position shown in fig. 5, a new food object can be placed in the object carrier 8 and be processed, etc.

[0066] In fig. 5 it is furthermore indicated that the vertical carrier part 8a is configured with slots 12, which are placed such that they correspond to the lateral position of the cutting blades 20, which thus can pass through these slots 12, when the cutting part 4 is moved in the cutting direction C.

[0067] Also, it is indicated in fig. 5 that the vertical carrier part 8a as well as the horizontal carrier part 8b are generally formed with rounded shapes to accommodate a food object such as a potato and such that the horizontal carrier part 8a can effectively support the food object when the cutting blades 20 cut through the food object in the cutting direction C.

[0068] Fig. 7 is a sideview of an apparatus 1 according to an embodiment of the invention, shown in a scenario with a food object 40, e.g. potato positioned in the apparatus, which food object will be cut by the cutting blades 20, when the cutting part 4 is moved in the cutting direction C.

[0069] Correspondingly, in fig. 8 an apparatus according to an embodiment of the invention is seen from above and in the same scenario as shown in fig. 7 with a food object 40, e.g. a potato positioned in the apparatus 1. Furthermore, it is indicated that a number of cutting blades 20 are mounted by means of the upper part 28, e.g. placed in respective and generally parallel planes, which extend in the firsts axis A of the cutting part 4. These planes may be positioned with the same mutual distances along a second axis in the transverse direction, i.e. perpendicular to the first axis A. Alternatively, the distances may differ, if found advantageously.

[0070] A regards the position of the cutting blades 20 in the direction of the first axis A, in particular in the cutting direction C, the cutting blades are arranged such that at least one of these is positioned forward of at least one other of the cutting blades 20. As indicated in fig. 8, the cutting blades are arranged in an inverse arrow shape with the outermost cutting blades at each side being arranged in the leading position, where they generally are expected to contact the food object first, while the cutting blade or blades at the middle part of the upper part 28 is/are generally the last to contact and cut the food object. It will be understood that instead of an inverse arrow configuration, the cutting blades 20 may be positioned in an arrow configuration in the cutting direction C. Other configurations are possible, which will be exemplified further in connection with e.g. figs 11a-11e.

[0071] Fig. 9 is an end view of an apparatus 1 according to an embodiment of the invention, wherein the apparatus is seen in the cutting direction. Thus, it is seen that on the end of the base part 6 and reaching downwards is placed the fixing means 14, e.g. in the form of a list or the like for abutting against a table edge or the like as previously exemplified. Further, the vertical object carrier 8a is shown as well as the sidewalls 26 and the upper part 28 of the cutting part 4.

[0072] Further details are shown in fig. 10, which as indicated is an enlarged view of a portion of the apparatus as shown in fig. 9. In fig. 10, it is seen that the cutting

blades 20 are held in the upper part 28 and are arranged in mutually parallel planes, which are extending downwards essentially perpendicular to the upper part 28, e.g. essentially vertically, when the support part 2 is placed horizontally. Further, it is seen that the cutting blades 20 may be positioned in an essentially equidistant manner in the transverse direction of the apparatus 1. Furthermore, it is shown that the vertical object carrier 8a is configured with a number of slots 12, the shape, width and positions of which correspond to the cutting blades 20.

[0073] In figs 11a-e various examples of the cutting blade configuration according to embodiments of the invention are shown. In all of these examples, the cutting blades 20 are seen from below and upwards towards e.g. an upper part (not shown in these figures) that carries the cutting blades 20. Thus, in case the cutting blades 20 are of an essentially triangular form as shown in figs. 3 and 4, the cutting blade tip 22 of each cutting blade 20 can be seen as well as a forward facing inclined cutting blade edge 24. It is noted that the number of cutting blades in figs. 11a-e as exemplary embodiments are 10 in figs. 11a-11b and 9 in figs. 11c-11e. It will be understood, though, that any suitable number of cutting blades may be utilized, for example in a range from 8 to 25, in a range from e.g. 10 to 20, etc. In a further embodiment, the number of cutting blades 20 may be 15 as it later will be shown. However, it will be understood that the examples shown in figs. 11a-e may serve to illustrate various configurations that may be implemented regardless of the actual number of cutting blades.

[0074] In fig. 11a an inverted arrow shape configuration is shown, having as a non-limiting example 10 cutting blades being arranged symmetrically in relation to a middle part and where the outermost cutting blades 20 on each side are positioned in the foremost position in the cutting direction C. The other cutting blades are positioned stepwise towards the middle position and in the opposite direction to the cutting direction C.

[0075] In fig. 11b a configuration essentially corresponding to the one shown in fig. 11a is illustrated, but where it is shown that the outermost cutting blades 20 on each side are not positioned in the foremost position in the cutting direction C, but at a second position. The configuration is symmetrical and at each step in the cutting direction only two cutting blades are positioned, thus allowing the cutting of the food object, e.g. a potato in such a manner that the cuts are performed sequentially and without the need to have a three, four or more of a number of cutting blades cutting through one and the same part in the transverse direction of e.g. a potato at one and the same time.

[0076] In fig. 11c a configuration essentially corresponding to the one shown in fig. 11a is illustrated, but where as a non-limiting example only 9 cutting blades are involved, thus having only one cutting blade arranged as the last one in the cutting sequence.

[0077] In fig. 11d a configuration essentially corresponding to the one shown in fig. 11c is illustrated, i.e. with 9 cutting blades 20, but where the positions in the cutting direction having been shuffled, but still in a symmetrical manner in relation to the middle position.

[0078] Further, in fig. 11e an arrow shaped configuration is shown, which comprises 9 cutting blades 20 and essentially is the configuration shown in fig. 11c in inversed form.

[0079] It will be apparent to a skilled person that a multitude of variations of e.g. cutting blade configurations are possible within the scope of the appended claims, e.g. based on the above and/or the following examples.

[0080] A further example of an embodiment of an apparatus according to the invention will be explained in the following with reference to figs. 12 to 20. This example of an apparatus is in general configured as explained above in connection with figs. 1 to 11 apart from specific features as it will be elucidated in the following. Thus, the same reference numbers as used in connection with figs. 1 to 11 will be used for the same features.

[0081] In fig 12 is show an example of a cutting part 4, seen in a perspective view, which cutting part 4 generally comprises two sidewalls 26 and an upper part 28, which is configured for carrying a plurality of cutting blades 20, positioned in respective planes. As it can be seen, a few of these cutting blades 20 are visible, e.g. the last cutting blades to cut into a food object when the cutting part 4 is moved in the cutting direction C.

[0082] As explained above, guiding means such as guide lists 30 or the like can be arranged to guide the cutting part 4 in relation to a support part.

[0083] Fig. 13 shows such a corresponding support part 2, seen in a perspective view, which support part 2 comprises a base part 6, upon which an object carrier 8 is placed. As previously explained, the object carrier 8 may comprise a vertical carrier part 8a and a horizontal carrier part 8b for supporting a food object (not shown in fig. 13). The object carrier 8 may comprise one or more holding pins 10 or the like, for example here holding pins 10 as shown in fig. 13 for facilitating the positioning of a food object. The vertical carrier part 8a may comprise a plurality of slots 12, corresponding to the positions of one or more of the cutting blades 20. As shown in fig. 13, these slots can be configured by upright walls 13 and instead of having one slot 13, which corresponds to one cutting blade only, a slot can correspond to two or more cutting blades. As shown in fig. 13, only five slots 13 may be arranged, where each corresponds to two or more cutting blades and where for example a slot at the middle may serve as passage for e.g. three, four, five or more of the cutting blades.

[0084] In fig. 14 the support part of fig. 13 is shown, wherein a food object 40, e.g. a potato, has been positioned on the object carrier 8, e.g. pressed down onto the holding pins 10, ready to be processed. As it can be seen, the food object 40 will be held by the horizontal carrier part 8b as well as the vertical carrier part 8a, including the upright walls 13, when a cutting part 4 is moved in the cutting direction.

[0085] A particular configuration of the plurality of cutting blades is illustrated in fig. 15, which shows an example of the upper part 28 of the cutting part 4 shown in fig. 12, but with the side walls, etc. removed and shown upside down. As it can be seen, a total of 15 cutting blades 20 are utilized, but it will be understood that any other suitable number can be utilized. Here, the middle cutting blade is arranged as the first cutting blade 20a to cut into a food object, when movement in the cutting direction is performed. The rest of the cutting blades are arranged in an inverse-arrow formation, so that the two outer cutting blades will be the second cutting blades 20b to cut into a food object and so that the two cutting blades positioned on each side of the middle cutting blade will be the last cutting blades 20c to cut into a food object. It will be apparent that modifications to such an arrangement can be made. However, by an arrangement of the cutting blades in such a fashion, it is ensured that the cutting can be performed with the food object, e.g. a potato, being held stably and with the cutting being performed in a smooth and relatively effortless manner.

[0086] In fig. 16 the cutting part 4 and the support part 2 as generally shown in figs. 12-15 are shown assembled and ready to perform a processing of a food object, generally in a manner as explained in connection with figs. 1-11.

[0087] Figs. 17 and 18 show the apparatus 1 of fig. 16, seen from the side in a schematic view and with inner parts indicated with dotted lines. Also, a food object 40 is positioned in/on the object carrier 8, in fig. 17 shown prior to cutting and in fig. 18 in a scenario where the food object 40 is in the process of being cut. Thus, in these figures it is shown that when the cutting part 4 is moved in the cutting direction C, the food object will be cut first by the first cutting blade 20a, subsequently by the (one or more) second cutting blade 20b, etc. and ending with the (one or more) last cutting blade 20c in the cutting sequence. As shown in fig. 18, the first cutting blade 20a has finished its cut through the food object 40 and three rows or sequence steps of cutting blades 20 are in the process of cutting through the food object 40. Assuming that each three row or sequence step of cutting blades 20 comprises two cutting blades, it will be seen that with the food object size and the distance between cutting blade steps, a maximum of six cutting blades will at any time be cutting through the food object, meaning that the necessary force that a user will need to exert is limited to a cutting force corresponding to six cutting blades. It is apparent that other values can be used, e.g. by using greater or smaller distances between the respective cutting blade steps.

[0088] As an example, the distance between two consecutive cutting blade steps may be in a range from e.g. 10 mm to 40 mm, in another embodiment in a range from 15 mm to 30 mm and in a particular embodiment around 20 mm.

[0089] Fig. 19 and 20 show end-views of the apparatus 1 as shown in fig. 18, where in fig. 19 the apparatus is seen in the cutting direction C, and where in fig. 20 the apparatus is seen in the opposite direction, i.e. against the cutting direction C.

[0090] In fig. 19 is can be seen that the first cutting blade to cut 20a has cut completely into the food object 40 as has the second cutting blades to cut 20b, etc. while ten cutting blades 20 are still visible to the rear of the food object 40.

[0091] In fig. 20 it is shown that the first cutting blade to cut 20a has passed the food object 40, that the second cutting blades to cut 20b at each side is emerging as well while the rest are not visible yet on this side of the food object 40. In fig. 20 it can further be seen that the slots 12 and the upright walls 13 are configured in such a manner that four slots, two at each side, are arranged to correspond to two cutting blades 20, while the middle slot is arranged to correspond to seven cutting blades 20.

[0092] In the above description, various embodiments of the invention have been described with reference to the drawings, but it is apparent for a person skilled within the art that the invention can be carried out in an infinite number of ways, using e.g. the examples disclosed in the description in various combinations, and within a wide range of variations within the scope of the appended claims.

List of reference numbers

[0093]

1.	Apparatus for processing of a food object
2.	Support part
4	Cutting part
6	Base part
8	Object carrier
8a	Vertical carrier part
8b	Horizontal carrier part
10	Holding pin
12	Slot for cutting blade
13	Upright wall
14	Fixing means for support part
20	Cutting blade
20a	First cutting blade to cut
20b	Second cutting blade to cut
20c	Last cutting blade to cut
22	Cutting blade tip
24	Cutting blade edge
26	Sidewall
28	Upper part
30	Guide list
40	Food object such as e.g. a potato
42	Cut in the food object
A	First axis
C	Cutting direction
D	Distance between lower parts of cutting blades and supporting surface
M	Moving directions

Claims

1. An apparatus for processing of a food object (40) such as a potato, said apparatus (1) comprising

   - a support part (2) for supporting said food object (40) and
   - a cutting part (4) comprising a plurality of cutting blades (20),

   said apparatus **characterized in that**

   - said plurality of cutting blades (20) are positioned in respective planes by said cutting part (4), said planes extending along a first axis (A) of said cutting part (4), wherein at least one of said plurality of cutting blades (20) is positioned forward of at least one other of said plurality of cutting blades (20) along said first axis (A), and **in that**
   - said support part (2) and said cutting part (4) are configured for being movable in relation to each other in the direction of said first axis (A), and
   - wherein a distance is defined between said plurality of cutting blades (20) and an opposing part of said support part (2).

2. The apparatus according to claim 1, wherein said support part (2) for supporting said food object (40) comprises an object carrier (8) for positioning the food object (40), which object carrier (8) comprise a horizontal carrier part (8b) and a vertical carrier part (8a).

3. The apparatus according to claim 2, wherein said object carrier (8) for positioning the food object (40) comprise at least one holding pin (10).

4. The apparatus according to claim 2 or 3, wherein said distance defined between said plurality of cutting blades (20) and an opposing part of said support part (2) is a distance (D) in a vertical direction between a lower part of said plurality of cutting blades (20) and said horizontal carrier part (8b).

5. The apparatus according to any one of claims 2-4, wherein said vertical carrier part (8a) comprises a plurality of slots (12), which corresponds to the position of the plurality of cutting blades (20), when passing the object carrier (8).

6. The apparatus according to any one of claims 1-5, wherein said cutting part (4) comprises side walls (26) and an upper part (28), which upper part (28) is configured to carry said plurality of cutting blades (20) extending downwardly in said respective planes.

7. The apparatus according to claim 6, wherein said plurality of cutting blades (20) are extending downwardly in said respective planes, which are essentially parallel with each other.

8. The apparatus according to any one of claims 1-7, wherein said plurality of cutting blades (20) are positioned in steps along said first axis (A), e.g. wherein one, two or more of said plurality of cutting blades may be positioned at each step.

9. The apparatus according to claim 8, wherein said steps along said first axis (A) are equidistantly arranged.

10. The apparatus according to any one of claims 1-9, wherein said plurality of cutting blades (20) each comprises a cutting blade edge (24) and/or a cutting blade tip (22) and that said plurality of cutting blades (20) are positioned, based on the respective positions of said cutting blade edges (24) and/or said cutting blade tips (22).

11. The apparatus according to any one of claims 1-10, wherein said plurality of cutting blades (20) are positioned such along said first axis (A) of said cutting part (4) that cutting blades (20) at each outer side of the cutting part (4) are positioned forward of the remaining cutting blades along said first axis (A).

12. The apparatus according to anyone of claims 1-10, wherein said plurality of cutting blades (20) are positioned such along said first axis (A) of said cutting part (4) that one or more cutting blades (20) at a middle region of the cutting part (4) is/are positioned forward of the remaining cutting blades along said first axis (A).

13. The apparatus according to any one of claims 1-12, wherein said support part (2) and said cutting part (4) are configured for being movable in relation to each other in the direction (M) of said first axis (A) in a sliding manner and that said support part (2) and/or said cutting part (4) are/is configured with one or more guide lists (30) or the like.

14. The apparatus according to any one of claims 1-13, wherein said support part (2) for supporting said food object (40) comprises fixing means (14) for fixing said support part (2), in particular during use.

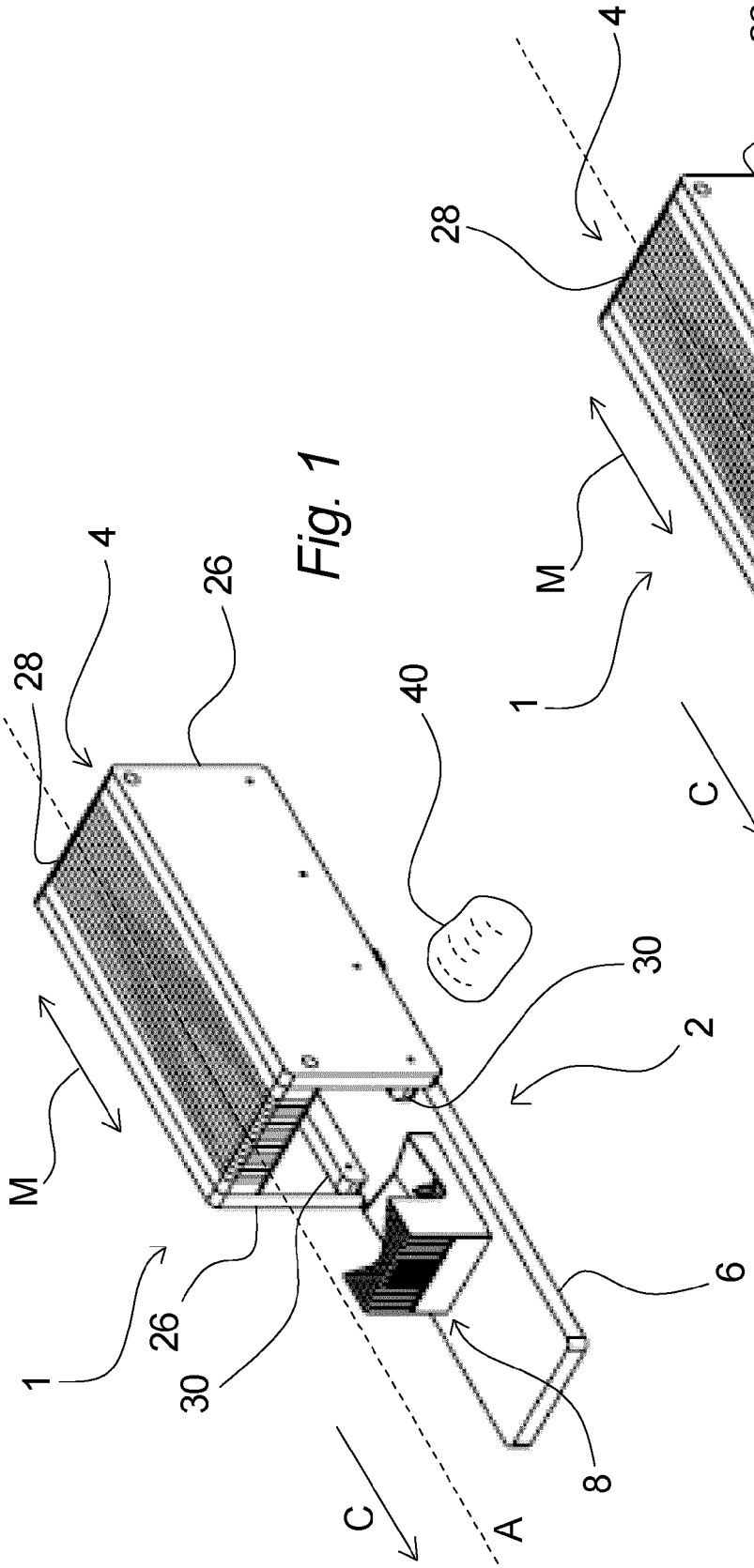


Fig. 1

Fig. 2

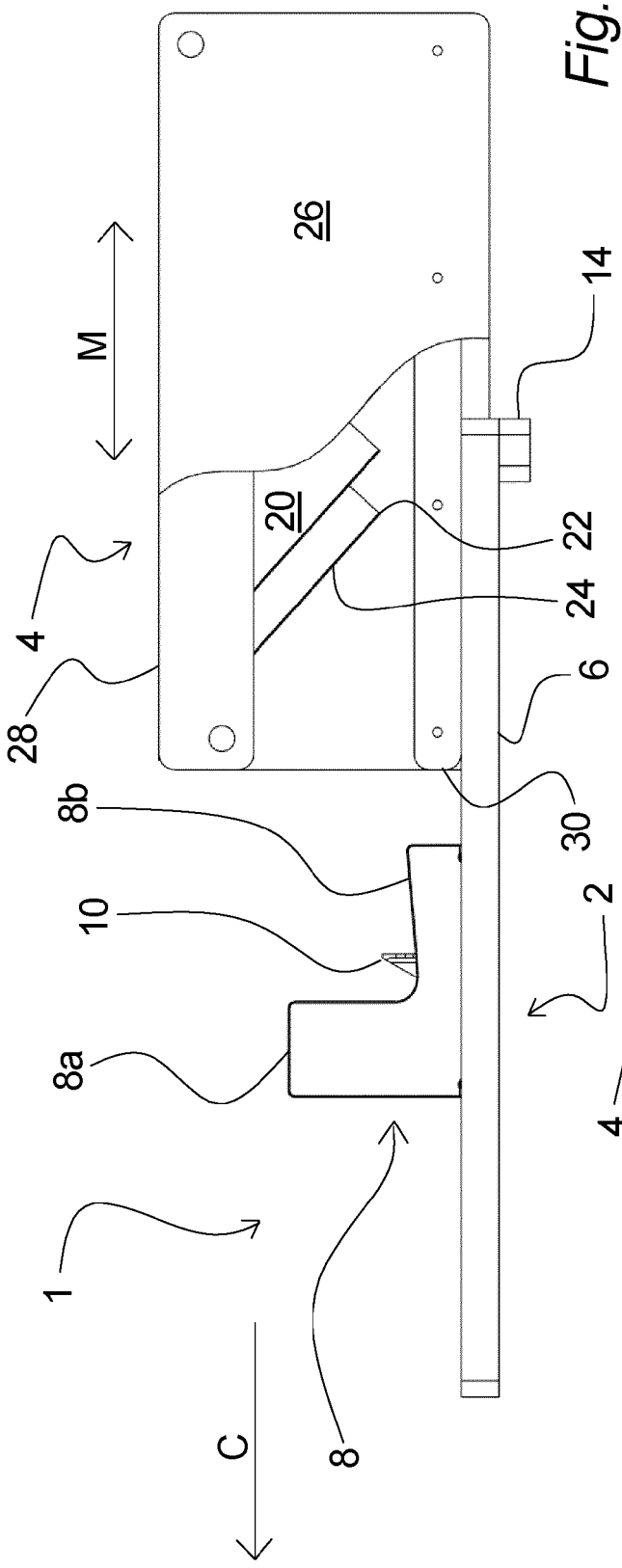


Fig. 3

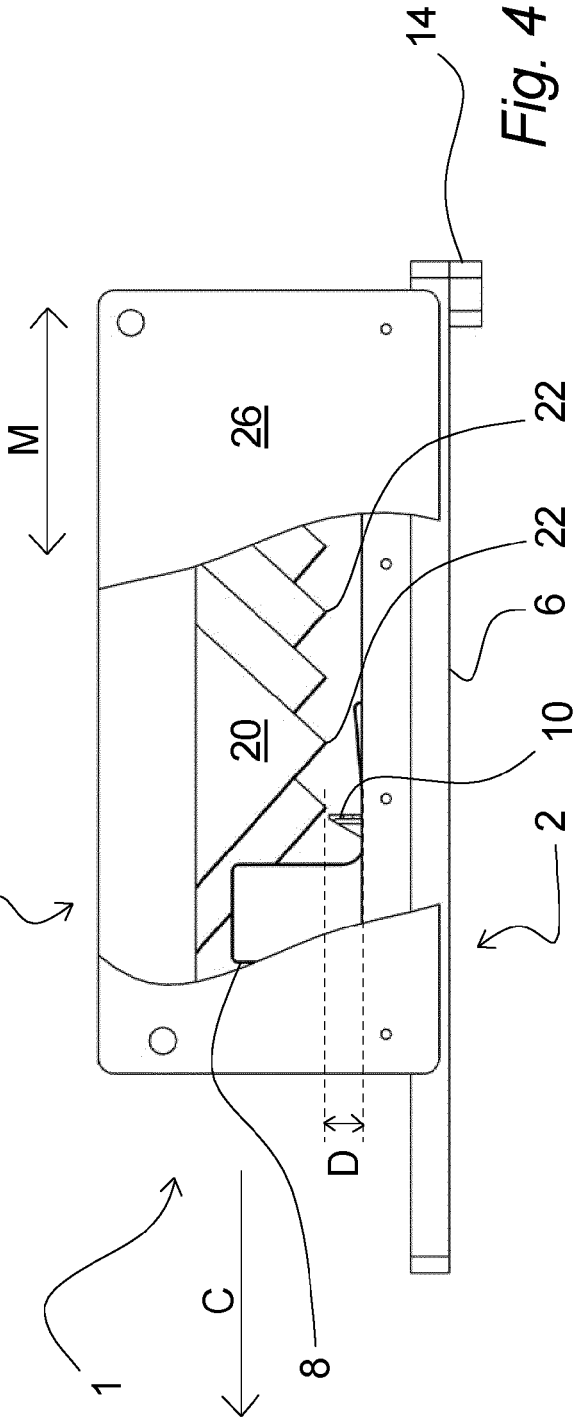


Fig. 4

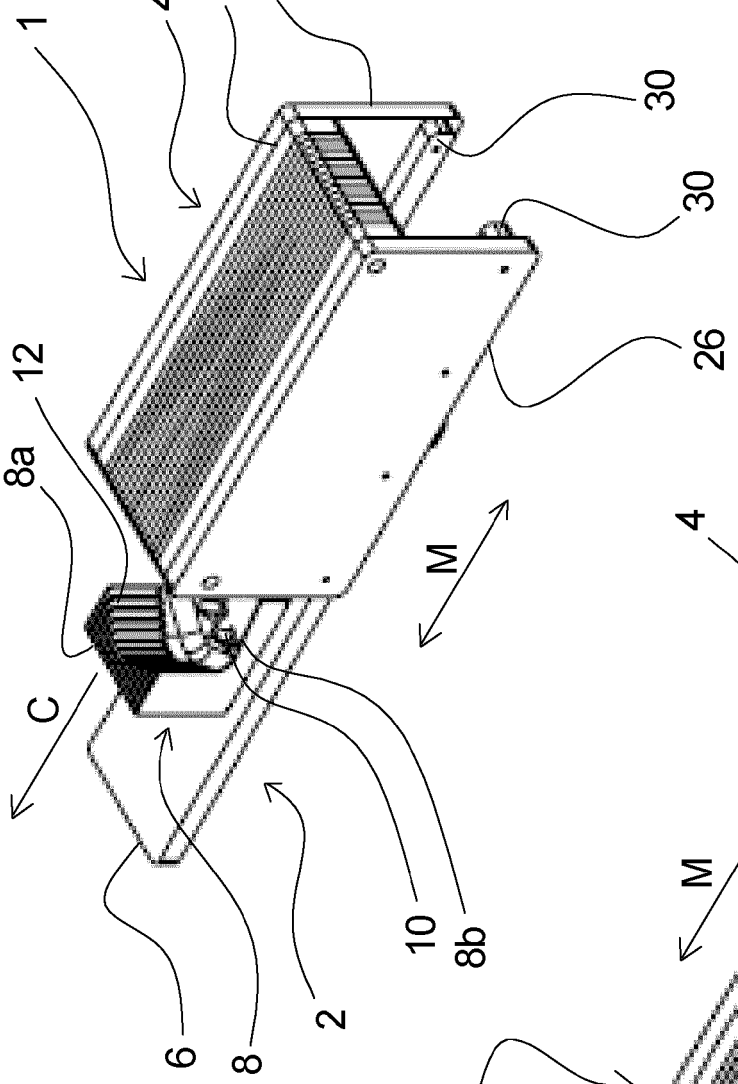


Fig. 5

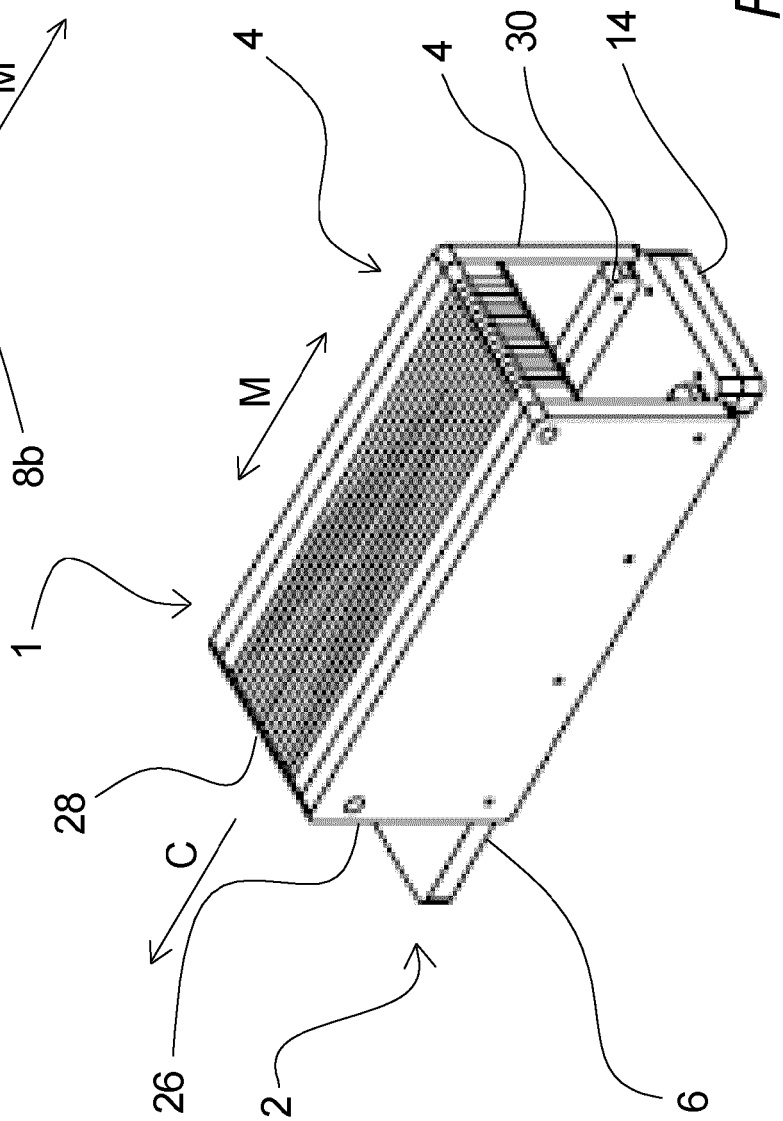


Fig. 6

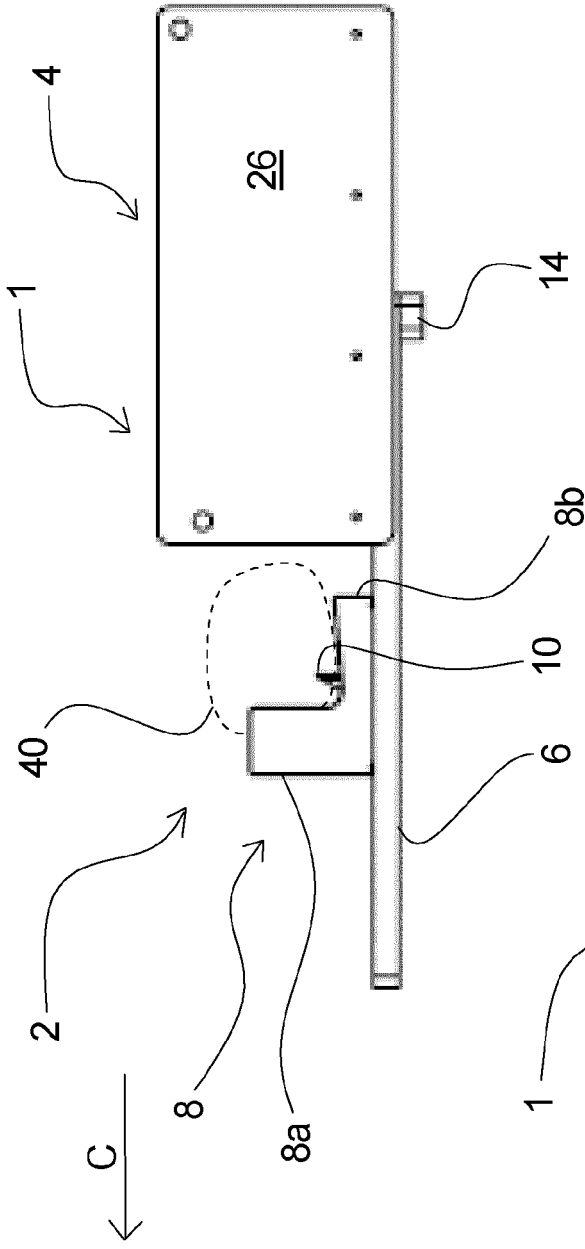


Fig. 7

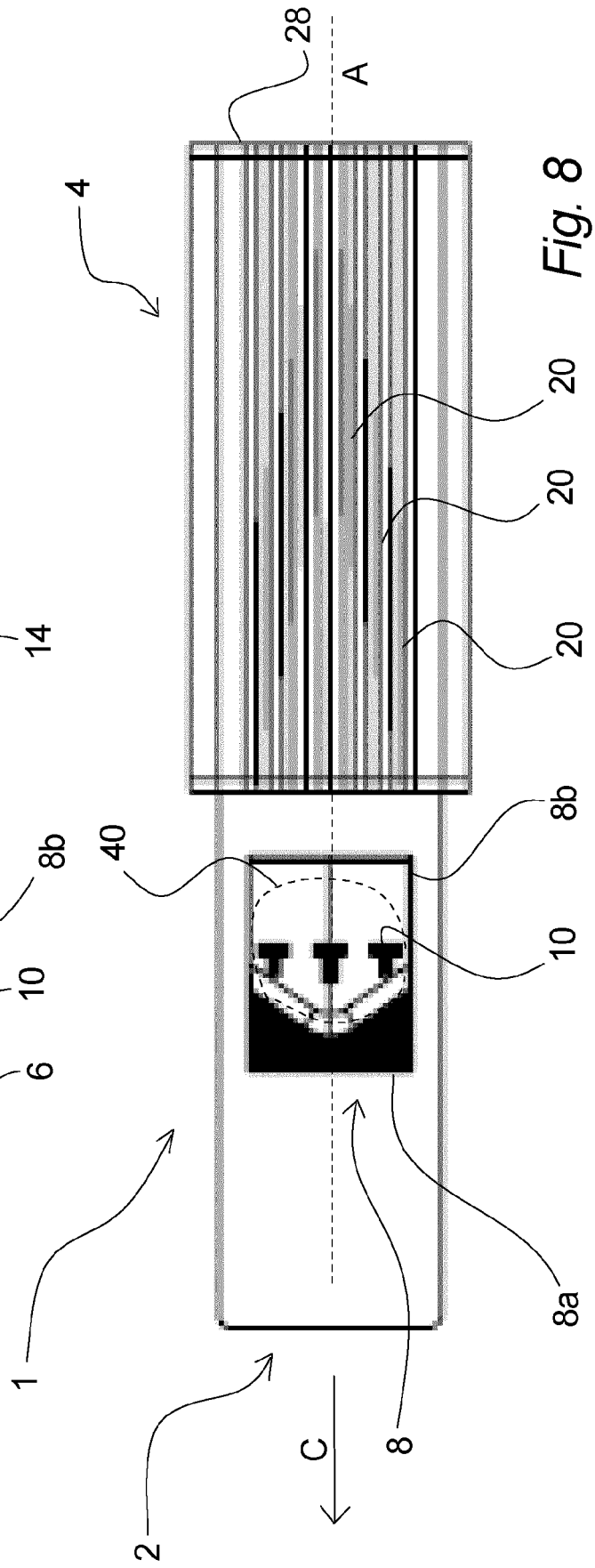


Fig. 8

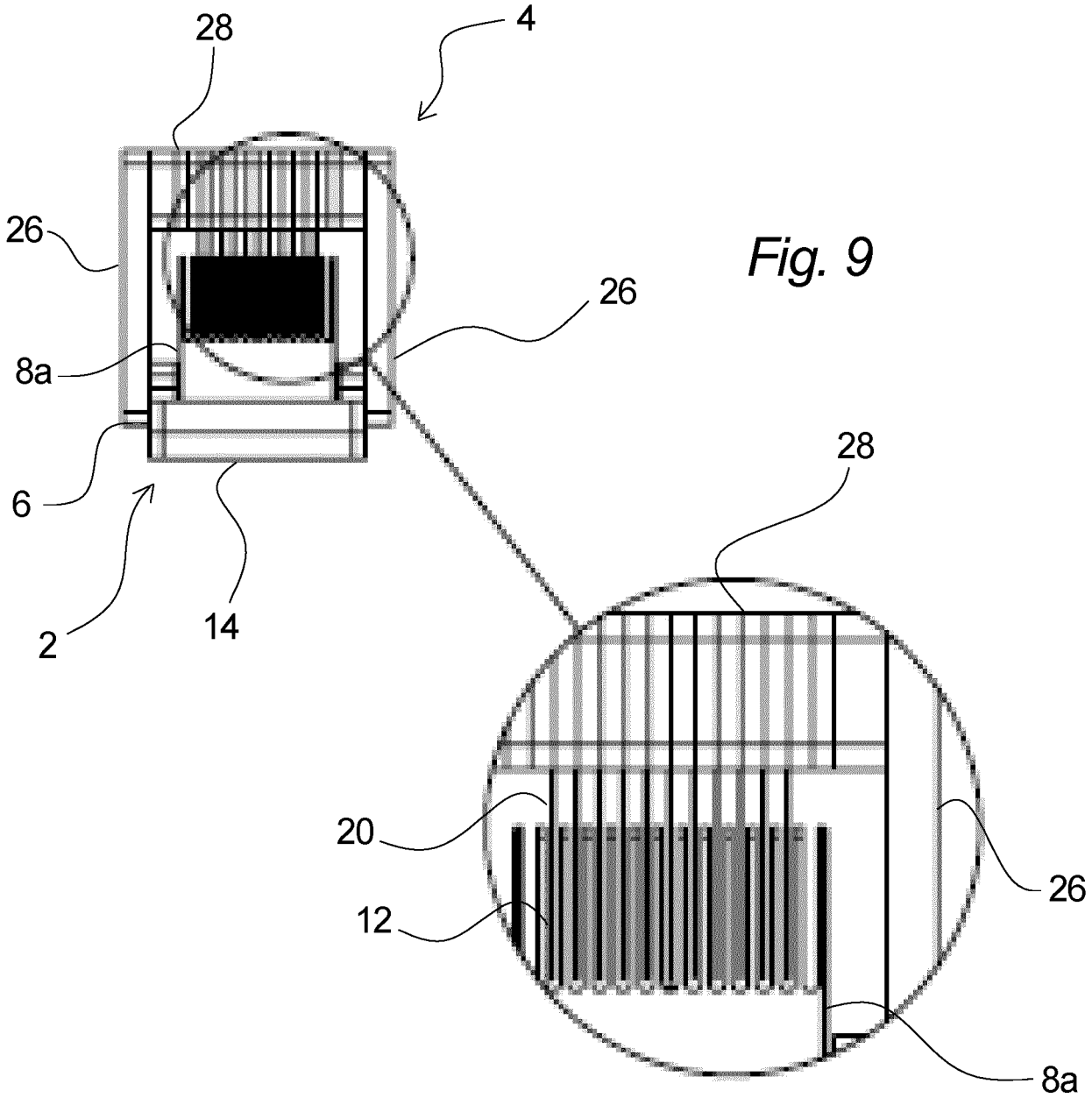


Fig. 9

Fig. 10

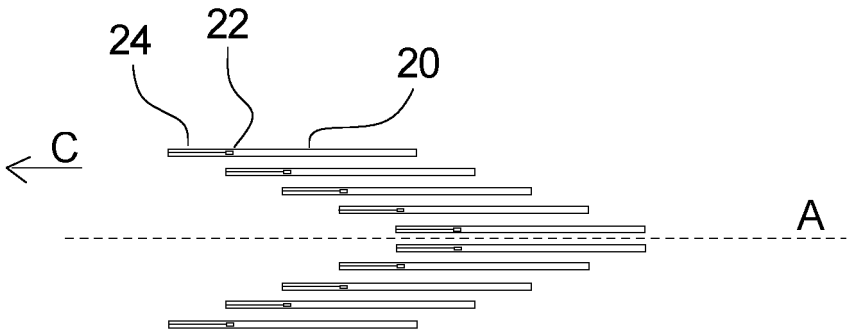


Fig. 11a

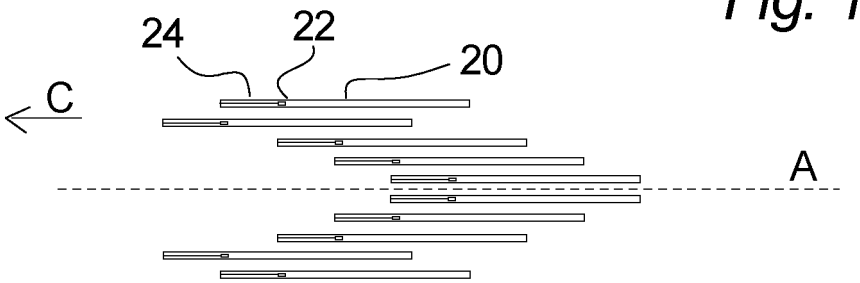


Fig. 11b

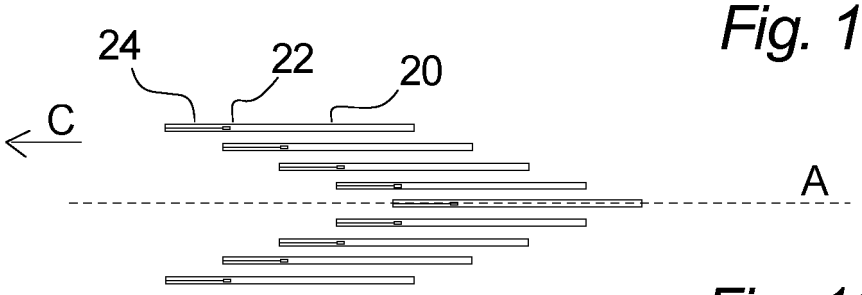


Fig. 11c

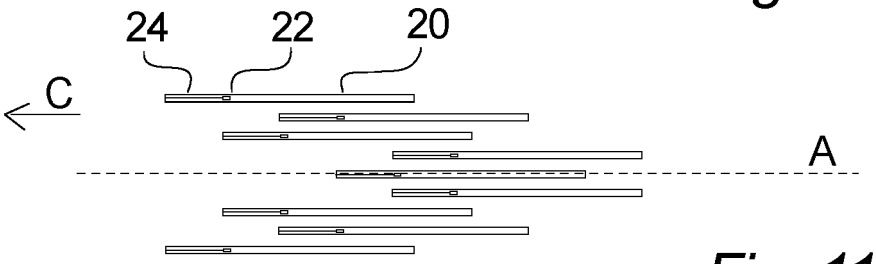


Fig. 11d

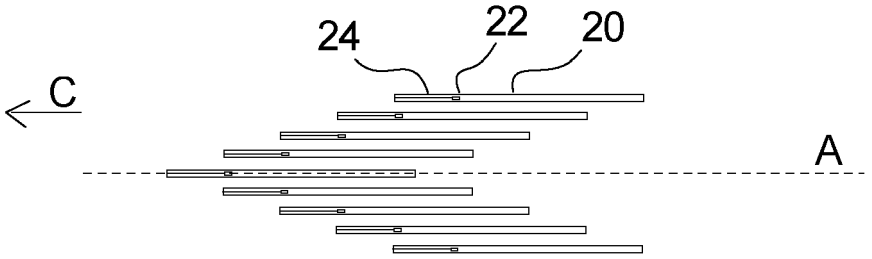


Fig. 11e

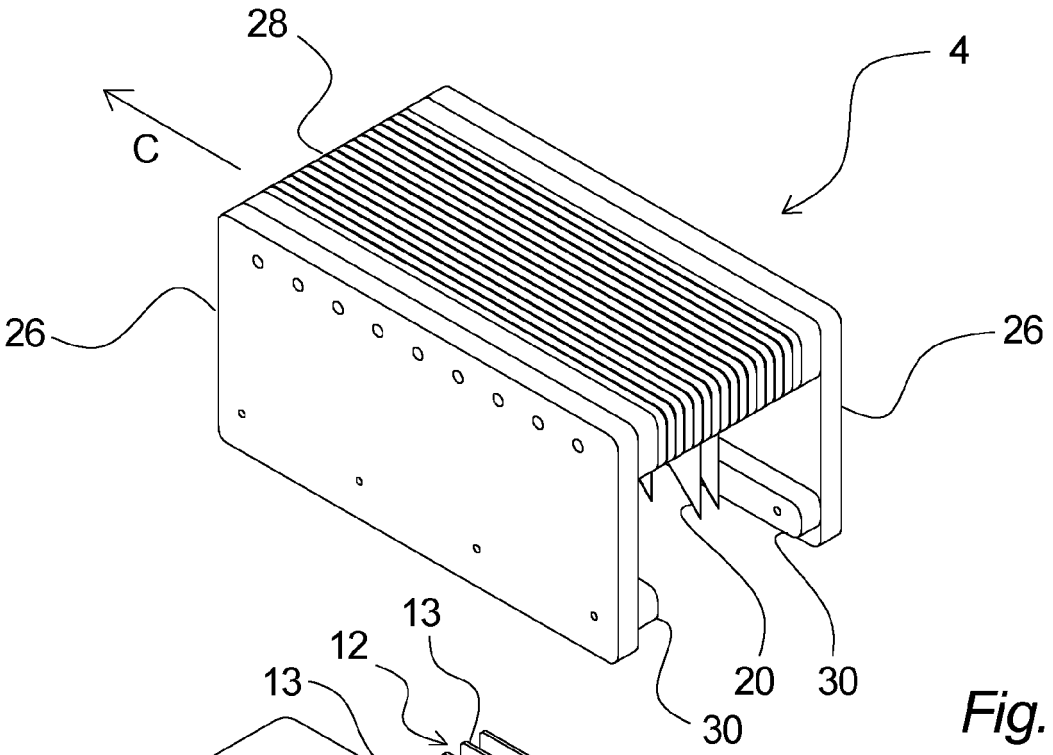


Fig. 12

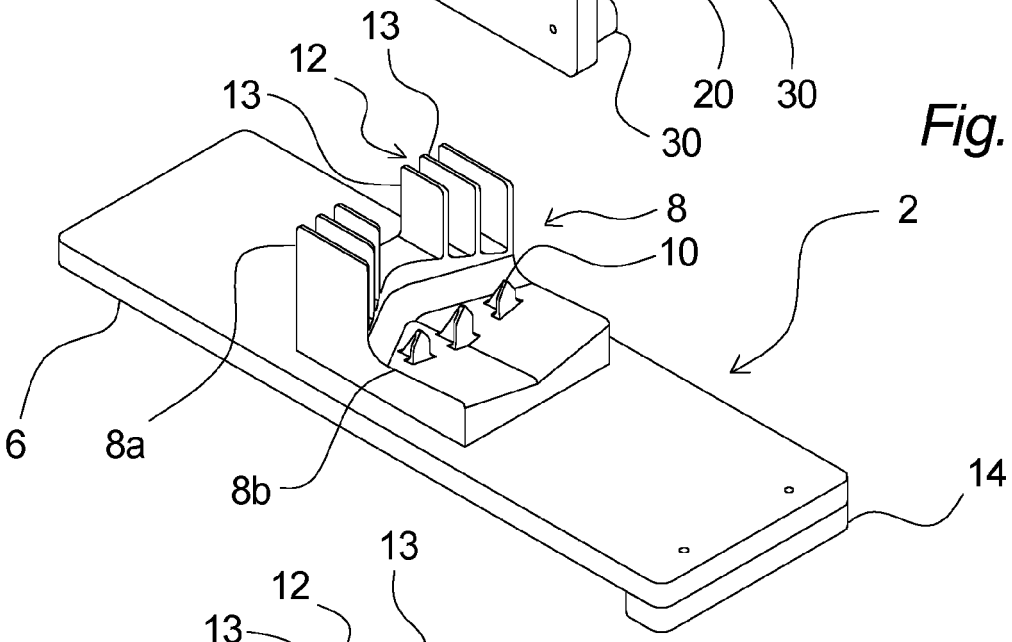


Fig. 13

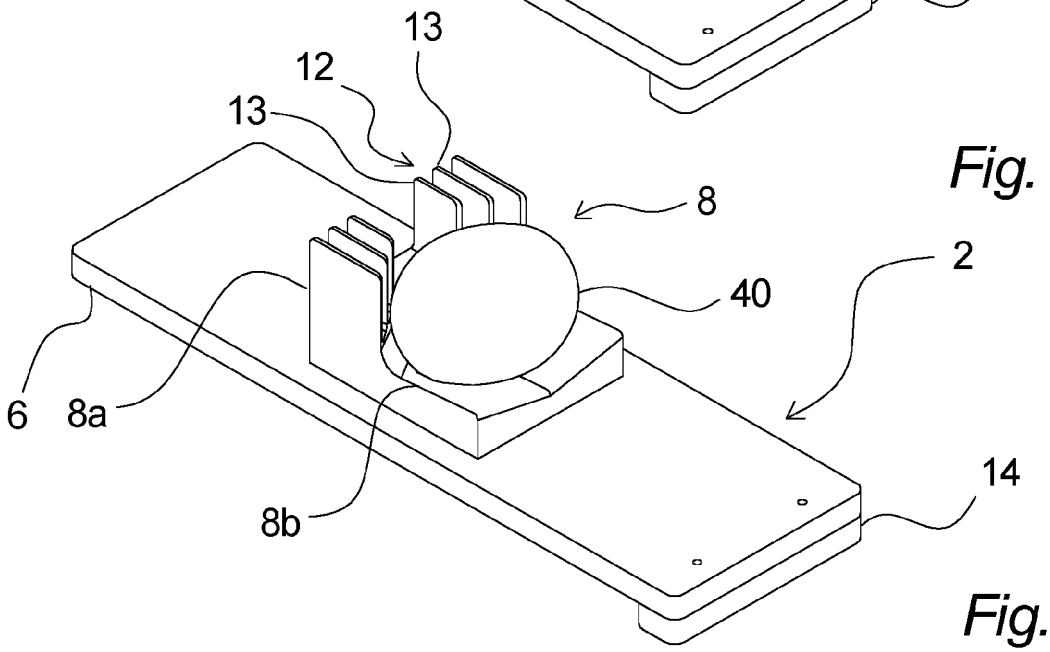


Fig. 14

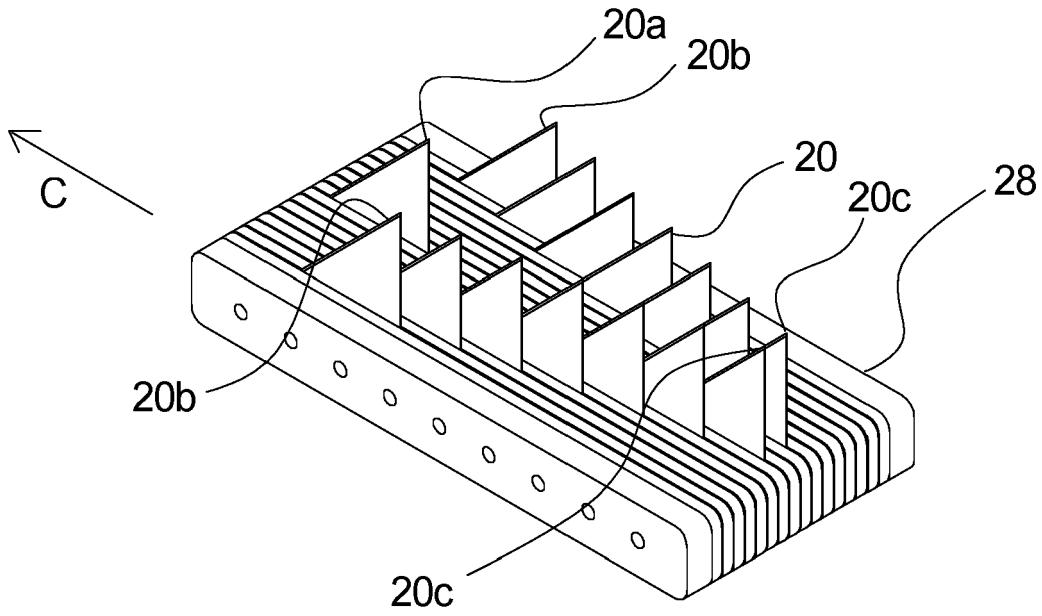


Fig. 15

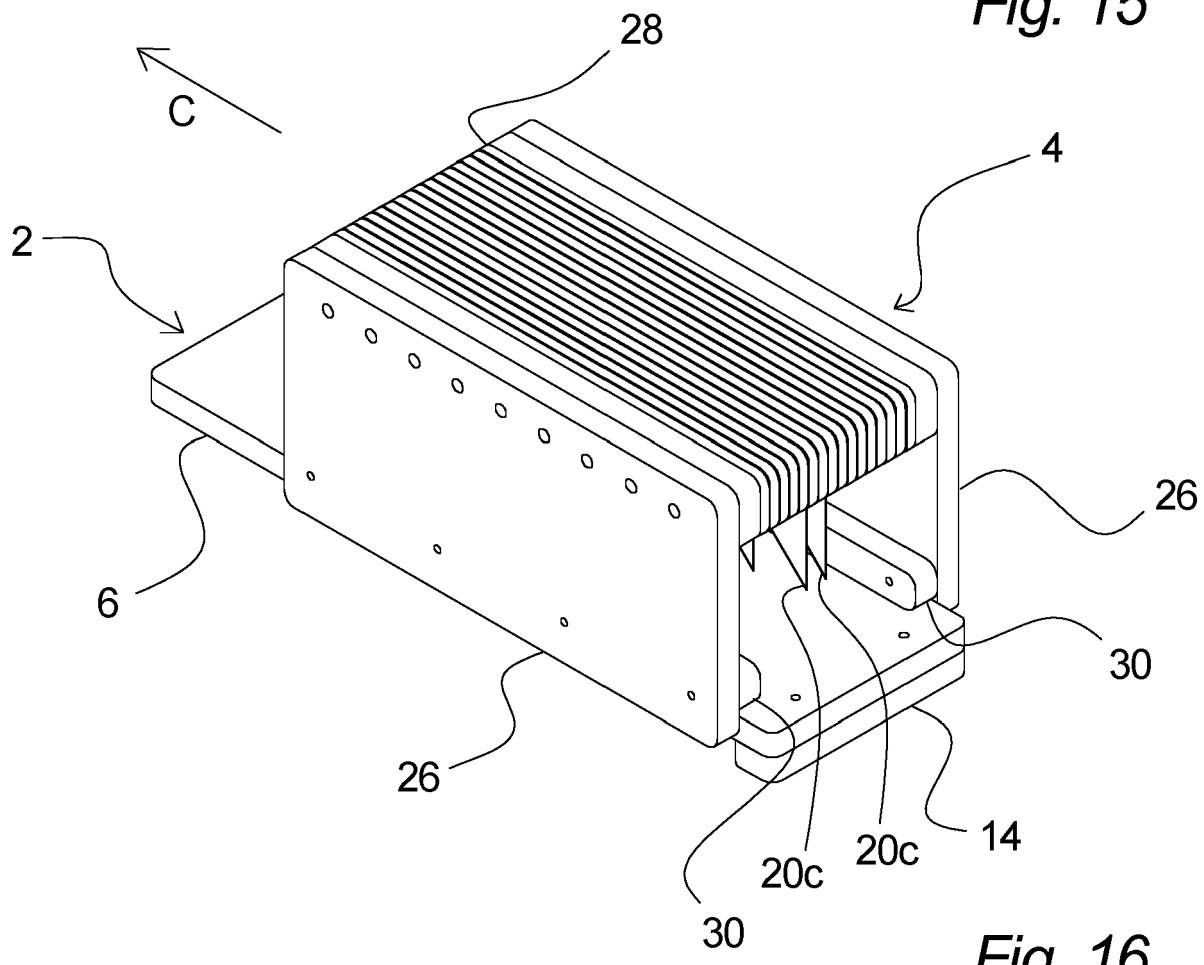
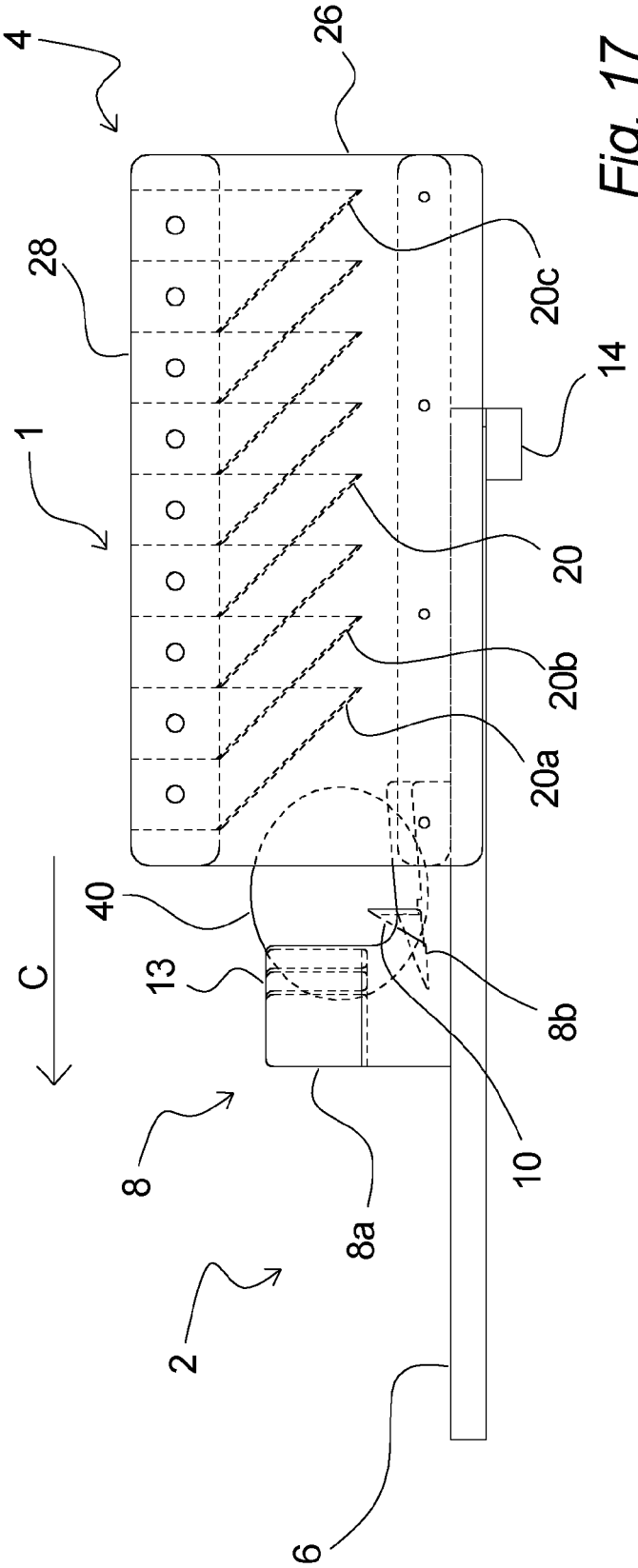


Fig. 16


4
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20c
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Fig. 17

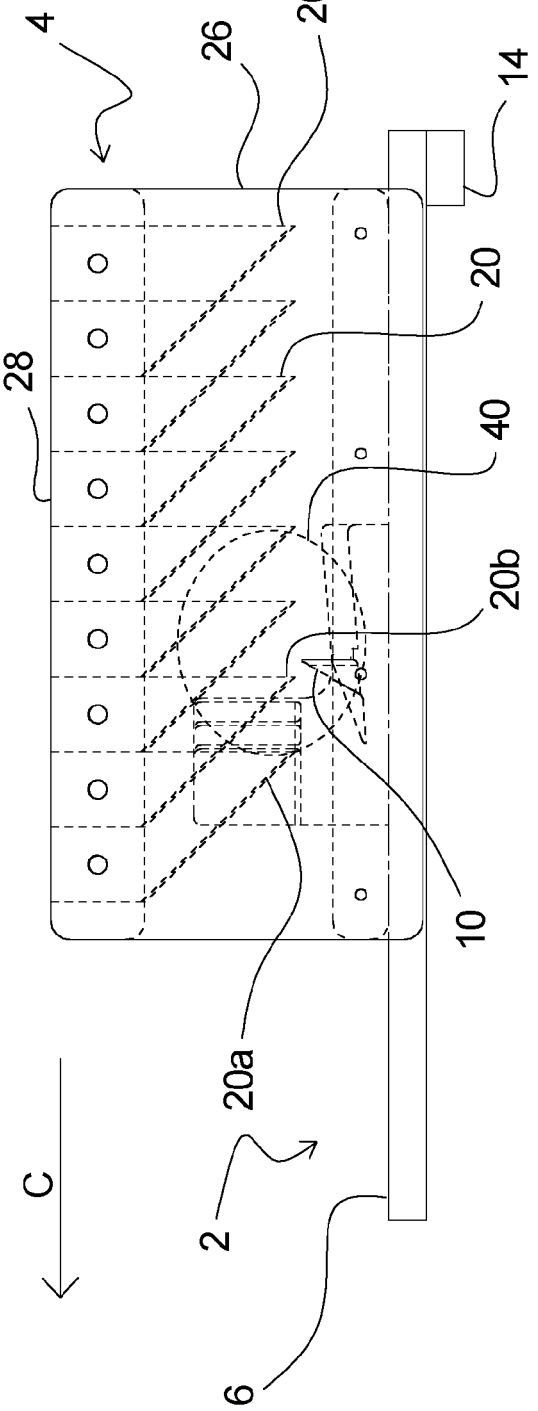
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Fig. 18

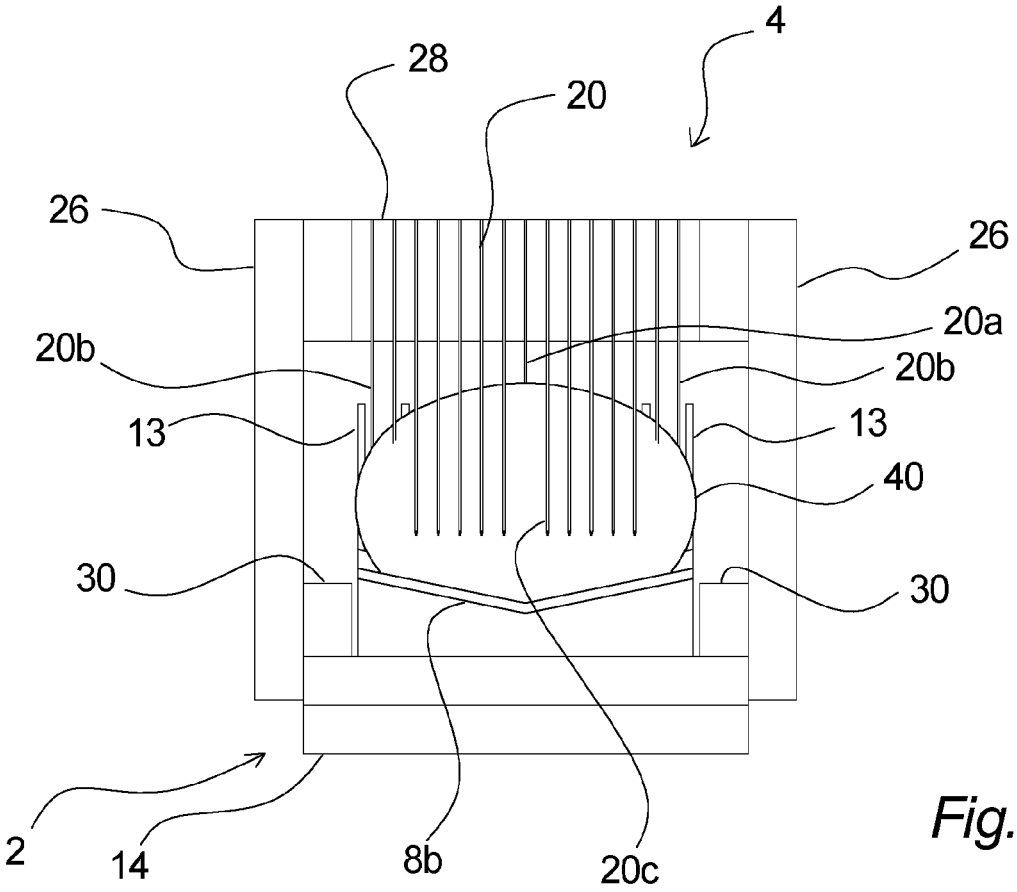
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Fig. 19

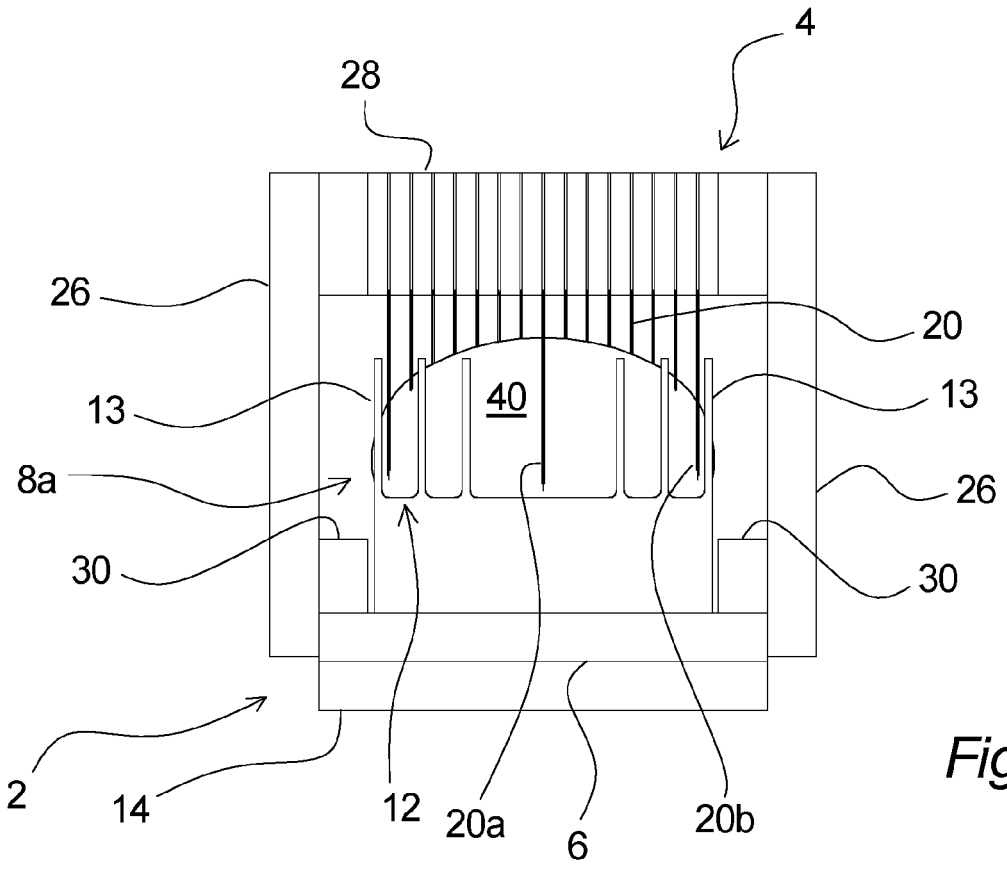
4
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Fig. 20

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EUROPEAN SEARCH REPORT

Application Number
EP 17 20 3144

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A,D	DK 2014 00186 U3 (VIBERG HANSEN STEEN [DK]) 8 April 2016 (2016-04-08) * the whole document *	1-14	
A,D	EP 3 047 945 A1 (MCCAIN FOODS LTD [CA]) 27 July 2016 (2016-07-27) * the whole document *	1-14	
A	US 2012/067183 A1 (STANOJEVIC IVAN [US]) 22 March 2012 (2012-03-22) * figures *	1-14	

TECHNICAL FIELDS SEARCHED (IPC)

B26D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 May 2018	Canelas, Rui

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 17 20 3144

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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16-05-2018

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