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(54) **DEVICE AND METHOD FOR CLOSING CONTAINERS**

VORRICHTUNG UND VERFAHREN FÜR DEN VERSCHLUSS VON BEHÄLTERN

DISPOSITIF ET PROCÉDÉ POUR FERMER DES RÉCIPIENTS

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(73) Proprietor: **Magic Production Group S.A.**
2632 Findel (LU)

(72) Inventor: **VACCARELLA, Paolo**
I-10020 Baldissero Torinese (Torino) (IT)

(74) Representative: **Bosotti, Luciano**
Buzzi, Notaro & Antonielli d'Oulx S.r.l.
Via Maria Vittoria, 18
10123 Torino (IT)

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Description

Technical field

[0001] The present description refers to the techniques for closing containers of the type that can be used, for example, for inserting so-called "surprises" in food products such as chocolate eggs and the like.

[0002] Reference to this possible field of application shall not however be deemed restrictive with respect to the scope of description.

Description of the related art

[0003] Shell containers including a first and a second vat-like half-shell to be coupled to each other in a front coupling relationship of the respective mouth portions are known in numerous embodiments, as documented by an extensive patent literature, including, for example, documents WO-A-2005/044677, WO-A-2005/110880 and WO-A-2007/074355. In particular, the last two mentioned documents illustrate containers in which the first and the second half-shell are joined to each other by a flexible member serving as a hinge and suitable to be obtained according to different methods.

[0004] The general problem of facilitating the use of such containers, especially regarding the filling and closing operations has already been addressed.

[0005] Documents EP-A-0 631 932, EP-A-0 631 933 and EP-A-0 631 934 prove development in this direction.

[0006] Among these, document EP-A-0 631 932 addresses the problem of coupling the two cup portions constituting the container, respectively serving as body and lid of the container in the closing condition. The solution described in EP-A-0 631 932 entails that the aforementioned closing movement be obtained as a result of an approaching movement between the two portions of the container previously carried in front aligned condition, with the part serving as lid arranged above the part serving as the body of the container.

[0007] Though automated solutions like the one described in the previously mentioned document are available, still the most common solution provides for that the closing operation be carried out manually. This solution, reveals various drawbacks, firstly the use of logistic related to the fact of carrying the various components of the surprises and the containers where the filling and closing operations are carried out before returning the closed and filled containers towards the sites of use thereof. Besides, manual operation does not allow ensuring complete quality control.

[0008] More specifically, the invention relates to a device according to the preamble of claim 1, which is known, e.g. from US 5 551 210A.

[0009] Also US 3518 811 is of some interest for the invention.

Object and summary of the invention

[0010] Thus, there arises the need of replacing the manual operations with operations that can be performed automatically, so as to facilitate integration with the sites of use, with the advantage of making the methods and times of performance of operations thereof entirely deterministic and repeatable.

[0011] The present invention aims at providing a response to such needs, regarding the operation of closing the shell-like container.

[0012] According to the present invention, such object is achieved due to a device having the characteristics specifically referred to in claim 1.

[0013] The invention also regards a corresponding method as called for in claim 9.

[0014] The claims form an integral part of the technical disclosure provided herein in relation to the invention.

Brief description of the attached figures

[0015] Now, the invention shall be described, purely by way of non-limiting example, with reference to the attached figures, including figures numbered from 1 to 5 representing the structure and the subsequent operating steps of an embodiment.

Detailed description of embodiments

[0016] Illustrated in the following description are various specific details aimed at providing an in-depth understanding of the embodiments. The embodiments may be obtained without one or more specific details, or through other methods, components, materials etc. In other cases, known structures, materials or operations are not shown or described in detail to avoid obscuring the various aspects of the embodiments.

[0017] Reference to "an embodiment" in this description indicates that a particular configuration, structure or characteristic described regarding the embodiment is included in at least one embodiment. Hence, expressions such as "in an embodiment", possibly present in various parts of this description do not necessarily refer to the same embodiment. Furthermore, particular configurations, structures or characteristics may be combined in any suitable manner in one or more embodiments.

[0018] References herein are only used for facilitating the reader and thus they do not define the scope of protection or the range of the embodiments.

[0019] The present detailed description refers to a device 10 that can be used for closing a shell-like container C of the type currently referred to as "barrel".

[0020] In various embodiments, the device 10 is per se suitable to operate even on only one container C at a time.

[0021] However, various embodiments provide for that the device 10 be capable of operating simultaneously on several containers C parallel to each other: in the em-

bodiments represented in the figures, the device 10 operates parallel on groups of containers C including an N number of containers equivalent to 5. Various embodiments are capable of operating parallel on an N number of containers different from 5.

[0022] In the examples considered herein, within the shell-like container C there can be distinguished two half-shells C1 and C2 with vat-shaped elements and cap-shaped end portions.

[0023] For the sake of brevity, such half-shells shall be referred to as "body" (half-shell C1) and "lid" (half-shell C2) hereinafter.

[0024] This distinction is used solely for the simplicity of description. In the case of the barrel C illustrated herein, the body C1 exhibits a skirt surface (the term skirt surface is used herein to indicate the lateral surface, adjacent to the contour of the mouth of the body C1) with a greater extension with respect to the skirt surface of the lid C2. In various embodiments, the dimensional ratios in question can be different (for example with the two skirt surfaces identical to each other). This, also considering the fact that the container C can be shaped differently from the shape illustrated herein, such as for example an oval (or shank) shape, a spherical shape, a prismatic shape, a cylindrical shape, etc.

[0025] Still, in the examples represented herein, the body C1 and the lid C2 are connected to each other by a flexible member C3 serving as a hinge. The hinge C3 is also suitable to be produced according to different methods: see, for example, documents WO-A-2005/110880 and WO-A-2007/074355, mentioned previously.

[0026] In the embodiments considered herein, the body C1 exhibits a collar part C12 and the coupling of the lid C2 to the body C1 is obtained as a result of inserting the collar part C12 (which projects from the edge of mouth of the body C1) into the mouth part of the lid C2.

[0027] In various embodiments, the device 10 includes one or more blocks 12 each including one or more cavities 14 intended to receive the bodies C1 of the containers C therein.

[0028] In the embodiment considered herein, the blocks 12 are arranged in a "train-like" structure which traverses the device 10 with a generally horizontal advancement trajectory, with a right to left movement with reference to the embodiments considered herein. Reference to this possible movement configuration is naturally entirely for exemplifying purposes in that, for example, the blocks 12 could be carried or integrated in a different conveying structure, for example a turntable structure. Also reference to a movement trajectory with constant conveyance direction is solely for exemplifying purposes, in that the block or blocks 12 could be moved alternatively.

[0029] The embodiments considered herein provide for the use several blocks 12 each of which is provided (according to a configuration generally similar to the cylinder head of an internal combustion engine) with a number of cavities 14 equivalent to 5. Obviously, the or each body 12 may include a different number of cavities 14.

[0030] The cavities 14 reproduce, in an approximately complementary manner, the configuration of the body C1 of the container C so as to receive the bodies C1 of the containers C therein. The insertion of the bodies C1 of the containers C into the respective holder structures constituted by the cavities 14 provided in the block or blocks 12 may be conducted by means of an automatic device such as a robot, not shown in the drawings but which can ideally be positioned on the bottom right part with reference to the point of view of the figures.

[0031] In various embodiments, the configuration of the cavities 14 (for the sake of simplicity hereinafter reference shall be made - coherently with the figures - to the presence of several blocks 12 each provided with a plurality of cavities 14) is such to allow that, upon insertion within a respective cavity 14, serving as a holder structure, the body C1 of the container C slightly projects with respect to the cavity 14.

[0032] In various embodiments (intended for closing the containers C in which the coupling of the body C1 and of the lid C2 is obtained due to the fitting of the collar part C12 protruding from the mouth edge of the body C1 in the mouth part of the lid C2) the cavities 14 are made in such a manner that, with the body C1 inserted in the cavity 14, the collar part C12 projects almost entirely from the cavity 14 as schematically illustrated in the bottom right part of figure 1.

[0033] In an embodiment, not exclusive, the cavities 14 are dimensioned so as to exert - with respect to the bodies C1 inserted therein - a "strong" retention action: in other words, each body C1 is inserted with interference (i.e. "interference-fitted") into the cavity 14 serving as a holder structure.

[0034] As noticeable by observing the bottom right part of the figures, which illustrate the condition in which containers C -- open -- are advanced towards the closing device 10, the body C1 and the lid C2 of each container C are arranged side by side with respect to each other, with the mouth edges thereof substantially coplanar and approximately tangent at the hinging area represented by the hinge C3, with the collar part C12 of the body C1 protruding with respect to the common lying plane of the mouth edges of the body C1 and of the lid C2, at least generally defined by the upper plane of the body 12.

[0035] In the illustrated embodiments, to be understood as examples, it was assumed that the containers C, as advanced towards the device 10, were previously filled (operating in the known manner) so as to contain therein:

- a sheet F (it can for example be a sheet bearing instructions for assembling the "surprise" inserted in the container C) folded and/or wound to form an approximately tubular shape,
- the assembly or portions K1, K2, etc of a small toy

or amusement object intended to be inserted within the container C.

[0036] The sheet F can be inserted, for example, according to the solution described in an industrial invention patent application filed on the same date by the same Applicant.

[0037] In various embodiments, the body C1 of the container C can be at least slightly deformed by slightly crushing (ovalising) the mouth part to facilitate the introduction of the articles K1, K2 etc.

[0038] As observable in the various figures (with particular reference to the bottom right part), the or each block 12 serves as a support body in which there are provided one or more holder structures (the cavities 14) each of which is capable of receiving the first half-shell C1 of one of the containers C with the second half-shell C2 hinged (in C3) to the first half-shell and freely protruding from one side of the support body 12.

[0039] The containers C are inserted in the cavities 14 of the blocks 12 with the body C1 and the lid C2 arranged adjacent to each other with the mouth edges thereof approximately coplanar - i.e. arranged in a common plane (horizontal in the example considered herein) approximately identified by the flat upper surface of the blocks 12. The mouth edges of the half-shells C1 and C2 are thus at least approximately tangent with respect to each other at the hinging area represented by the hinge C3, with the collar part C12 protruding with respect to the common lying plane of the mouth edges of the body C1 and of the lid C2.

[0040] In the various embodiments, the operation for closing the containers C requires the intervention of two devices 112 and 114 hereinafter referred to - for the sake of brevity - as "turnover device" (device 112) and "final closure device" (device 114).

[0041] Thus, as mentioned previously, the embodiments illustrated herein provide for that the device 10 operates simultaneously on an N number of containers C equivalent to 5. In the illustrated examples, both the turnover device 112 the final closure device 114 have a corresponding number of active elements (fingers 120 of the turnover device 112 and pressure elements 140 of the device 114, as better observable hereinafter).

[0042] Should the device 10 be intended to operate simultaneously on a number of containers C different from 5, the number of such active elements may vary. In the description hereinafter, reference shall be mainly made to the methods of manipulating only one container C, it being understood that they can be extended to an N number, virtually indefinite, of containers C.

[0043] In the embodiments illustrated herein, the active elements or fingers 120 of the turnover device 112 form - in their entirety - a structure that can be defined rake or fork-like. The fingers 120 extend starting from a common support plate 122 carried by the stem 124a of an actuator 124, so as to be movable approaching and moving away with respect to the block 12 which is currently aligned with the device 10 (according to methods better described hereinafter) controlled by the control unit K, such as for example a Personal Computer for industrial use, which also supervises the operation of the final closure device 114.

[0044] The fingers 120 are mounted on the plate 122 so that when the actuator 124 advances the plate 122 towards the block 12 currently positioned before the device 112 (see for example the sequence of figures 2 to 3) each of the fingers 120, cooperating with one adjacent finger 120 ends up arranged astride the lid C2 of one of the containers C inserted in the cavities 14 of the body 12 in question.

[0045] In presence of an N number of containers C intended to be handled simultaneously, an N pairs of fingers 120 (a pair of fingers for each of the N containers C) can provided mounted on the plate 122, hence 2N fingers 120 in all.

[0046] In various embodiments, the number of fingers 120 can also be reduced by allowing each finger 120 included in the array mounted on the plate 122, except for the two fingers 120 at the end position of the array, to operate simultaneously on two adjacent containers C. Thus, each of the fingers 120 arranged at an "inner" position (i.e. not an end position) of the array shall be capable of simultaneously operating on two lids C2 of the two containers C simultaneously taken to the closing position. In this case, instead of using 2N fingers 120 (ten in the example illustrated herein), N + 1 fingers will be enough in this case: this due to the fact that each of the fingers in the inner position of the array will be capable of simultaneously operating on two adjacent containers C.

[0047] In various embodiments, such configuration could be replaced by a rod suitably shaped to receive a part (an arc) of the lid C1. In such configuration, the number of rods (fingers) could be equivalent to the number of lids C1 to be overturned.

[0048] In various embodiments, the advancement trajectory of the "active" part of the closing device 112 (in practice the direction of movement of the shaft 124a of the actuator 124) is obtained along a trajectory forming an angle α with respect to the horizontal direction (i.e., in more general terms, with respect to the general lying plane of the mouth portions of the body C1 and of the lid C2 of the containers C received in the cavities 14 of the blocks 12).

[0049] In the illustrated embodiments (the same methods of operation can also be attained even by means of a structure/geometry at least slightly different) the fingers 120 are approximately cylindrical bodies with a distal end, preferably rounded, extended along respective axes lying in a common plane in which also the axis of shaft 124a of the actuator 124 lies. This common lying plane (of the axes) of the fingers 120 forms a dihedron with an opening angle equivalent to α with respect to the aforementioned general lying plane of the mouth portions of the bodies C1 and of the lids C2 of the containers C sub-

jected to the closing movement.

[0050] The movement of closing the containers C is substantially obtained as a result overturning the lids C2 onto the bodies C1, such turnover movement occurring around the hinging region identified by the hinge C3.

[0051] This turnover movement is attained due to the fact that the fingers 120 (or, more precisely, the distal ends of the fingers 120) advance towards the block 12 where the containers C are arranged with a movement which, due to the inclination angle α, has:

- both a horizontal component, with the fingers 120 - and in particular the distal ends thereof - approaching the block 12, on the side from which the lids C2 project cantilevered,
- and a down-upwards lifting component (detected in the vertical direction) moving the fingers 120 - and in particular the distal ends thereof - towards the upper plane of the bodies 12, i.e. towards the common lying plane of the mouth edges of the bodies C1 and of the lids C2 arranged adjacent thereto.

[0052] The sequence of figures 1 to 3 shows the methods of performing the aforementioned movement for overturning the lids C2 in the closed condition onto the bodies C1.

[0053] As a result of an actuation imparted by the unit K, the actuator 124 (usually a fluidic actuator such as a hydraulic jack) is activated so as to push - forward and upwards - the assembly (generally positioned "beneath" the containers C arranged in the blocks 12) constituted by the plate 122 and by the fingers 120 mounted thereon. The advancement movement of the fingers 120 allows the distal ends of the fingers to be engaged with the lids C2 (as mentioned previously, each lid C2 can be engaged astride by a pair of fingers 120 (or, as mentioned previously, by a suitably shaped single rod). The lids C2 are thus raised and overturned onto the bodies C1 rotating them around a centre of rotation (to be more accurate, an area of centre of rotation) identified by the region for hinging the lid C2 to body C1, represented by the hinge C3.

[0054] As a result of such movement, each lid C2 follows a gradual turnover movement around a horizontal axis substantially arranged in the hinge region C3. Such turnover movement gradually moves the lid C2 above the body C1 of the container C penetrating the collar part C12 of the body C1 into the mouth part of the lid C2.

[0055] Figure 2 shows an intermediate step of the aforementioned turnover movement in which the mouth edge of each lid C2 (initially arranged in a horizontal plane common with the plane in which the mouth edge of the corresponding body C1 lies), gradually rotating upwards, ends up arranged in an approximately vertical plane. All this is then followed by the aforementioned turnover movement up to a condition in which the mouth edge of the lid C2 is once again approximately positioned in a horizontal plane substantially corresponding to the common lying plane of the mouth edge of the body C1: this coplanar condition -- final - - (with the lid C2 enclosed on the body C1) is however attained after the lid C2 performs a 180° rotation with respect to the coplanar condition -- initial -- (with the lid C2 arranged sideways of the body C1) following the thrust action exerted by the distal ends of the fingers 120.

[0056] During the aforementioned turnover movement (still see the sequence of figures 1 to 3) the distal ends of the pair of fingers 120 which engages each lid C2 astride exert a thrust in a generally eccentric position with respect to the polar region of the lid C2. The sequence of figures 1 to 3 shows that each lid C2 is subjected, by the distal ends of the fingers 120 which operate thereon, to a thrust action including:

- a horizontal component (from left to right, with reference to the point of view of the figures), having the effect of translating the lid C2 above the corresponding body C1, and
- a vertical component, initially directed upwards and which, after being cancelled (practically approximately upon reaching the position represented in figure 2), gradually faces downwards increasingly contributing to the thrust action of the lid C2 approaching the body C1 with ensuing insertion of the collar part C12 into the mouth edge of the lid C2.

[0057] Experiments carried out by the Applicant show that the aforementioned turnover closing movement is obtained in an extremely accurate and deterministic manner preventing the presence of the sheet F and of the components or elements K1, K2, etc present in the body C1 from interfering with the closing movement of the container C.

[0058] Though without restriction to any specific theory addressing this subject, the applicant deems such result to be reproduced in a particularly accurate and reliable manner when, like it usually occurs, the container C is made of flexible material (for example thin plastic). In presence of flexible material, the turnover movement to close the lid C2, according to the conditions represented herein, probably provides a gradual regular elastic deformation of the collar part C12, in the sense of an at least slight deformation (or making oval). The deformation starts when the collar part C12 starts penetrating into the mouth part of the lid C2 and the penetration movement proceeds gradually (in particular see the sequence of figures 1 to 3) before being completed definitely when the lid C2 is entirely applied closing the body C1. At the same time, the fact that each lid C2 is "taken over" by a pair of fingers of the array 120 which operate on the lid C2 being arranged astride thereon ensures, even in presence of a flexible material, an accurate action for centring the lid C2 with respect to the fingers 120 operating thereon.

[0059] The final closing device 114 including one or more pressure elements 140 (generally an N number,

equivalent to the number of containers C intended to be closed simultaneously: N = 5 in the example considered herein) which, once the lids C2 are overturned in closing position on the respective bodies C1 (see figure 3), they are lowered up-downwards by one or more actuator elements 142 (for example hydraulic fluidic actuators, also controlled by the unit K) so as to consolidate the lids C2 in the closed position on the bodies C1.

[0060] This direct action for consolidating the closed condition of the containers C may lead to single lowering movements (see the sequence of figures 3 to 4), or a sequence of subsequent lowering movements (for example a lowering movement repeated two or three times) to allow the lids C2 to be accurately pressed in closed condition on the mouth edges of the respective bodies C1, without leaving room for residual inadvertent spreading apart.

[0061] In various embodiments, the pressure elements 140 are also generally concave-shaped, with concavity facing towards the blocks 12 where the containers C are positioned in closed condition. In various embodiments, the general concave development may take the V or U-shaped development (opening downwards i.e., generally, towards the containers C). This concave configuration also allows the pressure elements 140 to be arranged each astride the lid C2 which is consolidated in the closed position of the container C providing the automating centring function.

[0062] Upon completing the closing operation, the unit K intervenes on the turnover device 112 and on the final closing device 114 returning the first in the receded position (hence backwards downwards with reference to the condition illustrated in the attached representations) and returning the second upwards.

[0063] All this allowing the "train" for advancing the blocks 12 to perform an advancement step moving the previously closed containers C away from the device 10 and advancing a new block 12 containing one or more new containers C to be closed towards the device 10.

[0064] Furthermore, it shall be observed that the operation of returning or "re-triggering" the devices 112 and 114 may occur simultaneously or almost simultaneously, as represented herein in the sequence of figures 4 or 5 or in the subsequent steps. In particular, it can be provided for that the fingers 120 of the turnover device 112 be returned backwards downwards before lowering the pressure elements 140 on the containers C.

[0065] In various embodiments, the turnover device 112 may be mounted on a support structure (not shown in the drawings) of a floating type, i.e. such to allow a given swinging movement of the array of fingers 120 upwards or downwards, in the direction of variation of the angle α represented in figure 1) so as to allow adaptation to lids C2 having different shapes and dimensions. Once again, it should be borne in mind that the containers C may be shaped differently with respect to the barrel shape illustrated herein and have for example, a generally cylindrical development, a polygonal development such to involve the body C1 and/or the lid C2.

[0066] Without prejudice to the principle of the invention, the details and embodiments may vary, even significantly, with respect with respect to what has been described herein purely by way of non-limiting example, without departing from the scope of the invention as defined by the attached claims.

Claims

1. A device for closing containers (C) including a first (C1) and a second (C2) cup-shaped half-shell to be coupled with their respective mouth portions in a frontal mating relationship (C12) as a result of a turnover closing movement leading said second half-shell (C2), arranged sidewise of said first half-shell (C1), to turn over onto said first half-shell (C1), the device being **characterized in that** it includes:

- a support body (12) with a holder structure (14) to receive said first half-shell (C1) of at least one of said containers (C) with said second half-shell (C2) hinged (C3) to said first half-shell (C1) and protruding from one side of said support body (12), and
- a turnover element (112) including at least one pusher member (120) selectively actuatable to advance towards said side of the support body (12) to impart onto said second half-shell (C2) hinged (C3) to said first half-shell (C1) said turnover movement to close the container, and

wherein said pusher element includes at least one pair of pusher members (120) adapted to be arranged astride said second half-shell (C2) in producing said turnover movement.

2. The device of claim 1, wherein said support body (12) defines a common plane for the mouth portions of said first (C1) and said second (C2) half-shell to lie in when said second half-shell (C2) hinged (C3) to said first half-shell (C1) protrudes from one side of said support body (12) and in that said at least one pusher member (120) is movable to approach said side of said support body (12) and said common lying plane defined by said support body (12) following a trajectory angled (α) with respect to said common lying plane defined by said support body (12).

3. The device of claim 1 or claim 2, wherein said at least one pusher member (120) is finger-shaped.

4. The device of any of claims 1 to 3, wherein said pusher element includes at least one rod shaped to receive at least part of said second half-shell (C2).

5. The device of any of the previous claims, wherein:

- said support body (12) includes a plurality of holder structures (14) for a corresponding plurality of containers (C), and
- said turnover element (112) includes an array (120) of pusher members to cooperate with said plurality of containers (C).

6. The device of any of the previous claims, including a final closure element (114) including at least one pressure element (140) actuatable to advance towards said support body (12) to consolidate the second half-shell (C2) in its turned-over closed position onto a corresponding first half-shell (C1).

7. The device of claim 6, wherein said at least one pressure element (140) exhibits a general concave shape, preferably V shaped.

8. The device of claim 5 and one of claim 6 or 7, wherein said final closure element (114) includes a plurality of said pressure elements (140) to act on respective containers (C) in said plurality.

9. A method of closing containers (C) including a first (C1) and a second (C2) cup-shaped half-shell to be coupled with their respective mouth portions in a frontal mating relationship (C12) as a result of a turnover closing movement leading said second half-shell (C2) hinged (C3) to and arranged sidewise of said first half-shell (C1), to turn over onto said first half-shell (C1), the method including:

- arranging said first half-shell (C1) of one of said containers (C) in a support body (12) with a holder structure (14) for the first half-shell (C1) with said second half-shell (C2) hinged (C3) to said first half-shell (C1) protruding from one side of said support body (12), and
- providing a turnover element (112) with at least one pusher member (120) movable to advance towards said side of the support body (12),
- advancing said at least one pusher member (120) towards said side of the support body (12) to impart said turnover closing movement onto said second half-shell (C2) hinged (C3) to said first half-shell (C1), and

wherein said pusher element includes at least one pair of pusher members (120) adapted to be arranged astride said second half-shell (C2) in producing said turnover movement.

Patentansprüche

1. Vorrichtung zum Schließen von Behältern (C) mit einer ersten (C1) und einer zweiten (C2) becherförmigen Halbschale, die mit ihren entsprechenden Mündungsabschnitten in einer vorne passenden Beziehung (C12) als ein Ergebnis einer Drehschließbewegung zu koppeln sind, welche die zweite Halbschale (C2), die seitwärts der erste Halbschale (C1) angeordnet ist, zu einer Drehung auf die erste Halbschale (C1) führt, wobei die Vorrichtung **dadurch gekennzeichnet** ist, dass sie aufweist:

einen Trägerkörper (12) mit einer Haltestruktur (14), um die erste Halbschale (C1) von zumindest einem der Behälter (C) aufzunehmen, wobei die zweite Halbschale (C2) an der ersten Halbschale (C1) gelenkig (C3) angebracht ist und von einer Seite des Trägerkörpers (12) vorsteht, und
ein Drehelement (112), das zumindest ein Drückbauteil (120) aufweist, das selektiv betätigbar ist, um sich der Seite des Trägerkörpers (12) zu nähern, um an der zweiten Halbschale (C2), die an der ersten Halbschale (C1) gelenkig (C3) angebracht ist, die Drehbewegung aufzubringen, um den Behälter zu schließen, und
wobei das Drückelement zumindest ein Paar Drückbauteile (120) aufweist, die beim Herstellen der Drehbewegung rittlings der zweiten Halbschale (C2) angeordnet werden können.

2. Vorrichtung gemäß Anspruch 1, bei der der Trägerkörper (12) eine gemeinsame Ebene für die Mündungsabschnitte der ersten (C1) und der zweiten (C2) Halbschale definiert, um darin zu liegen, wenn die zweite Halbschale (C2), die an der ersten Halbschale (C1) gelenkig (C3) angeordnet ist, von einer Seite des Trägerkörpers (12) vorsteht, und dadurch, dass das zumindest eine Drückbauteil (120) bewegbar ist, um sich der Seite des Trägerkörpers (12) und der gemeinsamen liegenden Ebene zu nähern, die durch den Trägerkörper (12) definiert wird, der einer gewinkelte Trajektorie (α) bezüglich der gemeinsamen liegenden Ebene folgt, die durch den Trägerkörper (12) definiert wird.

3. Vorrichtung gemäß Anspruch 1 oder Anspruch 2, bei der das zumindest ein Drückbauteil (120) fingerförmig ist.

4. Vorrichtung gemäß einem der Ansprüche 1 bis 3, bei der das Drückelement zumindest eine Stange aufweist, die ausgestaltet ist, um zumindest einen Teil der zweiten Halbschale (C2) aufzunehmen.

5. Vorrichtung gemäß einem der vorganggegangen Ansprüche, bei der:

der Trägerkörper (12) eine Vielzahl von Haltestrukturen (14) für eine entsprechende Vielzahl von Behältern (C) aufweist, und
das Drehelement (112) eine Anordnung (120)

von Drückbauteilen aufweist, um mit der Vielzahl von Behältern (C) zusammenzuwirken.

6. Vorrichtung gemäß einem der vorganggegangen Ansprüche, aufweisend ein Abschlussschließelement (114), das zumindest ein Druckelement (140) aufweist, das betätigbar ist, um sich dem Trägerkörper (12) zu nähern, um die zweite Halbschale (C2) in ihrer gedrehten, geschlossenen Position auf der entsprechenden ersten Halbschale (C1) zu konsolidieren.

7. Vorrichtung gemäß Anspruch 6, bei der das zumindest ein Druckelement (140) eine im Wesentlichen konkave Gestalt, bevorzugt eine V-förmige Gestalt, darstellt.

8. Vorrichtung gemäß Anspruch 5 und einem der Ansprüche 6 oder 7, bei der das Abschlussschließelement (114) eine Vielzahl von Druckelementen (140) aufweist, um an den entsprechenden Behältern (C) in der Vielzahl zu wirken.

9. Verfahren zum Schließen von Behältern (C) mit einer ersten (C1) und einer zweiten (C2) becherförmigen Halbschale, die mit ihren entsprechenden Mündungsabschnitten in einer vorne passenden Beziehung (C12) als ein Ergebnis einer Drehschließbewegung zu koppeln sind, wodurch die zweite Halbschale (C2), die an der ersten Halbschale (C1) gelenkig (C3) angebracht und seitwärts angeordnet ist, zu einer Drehung auf die erste Halbschale (C1) geführt wird, wobei das Verfahren aufweist:

Anordnen der ersten Halbschale (C1) an einem der Behälter (C) in einem Trägerkörper (12) mit einer Haltestruktur (14) für die erste Halbschale (C1), wobei die zweite Halbschale (C2), die an der ersten Halbschale (C1) gelenkig (C3) angebracht ist, von einer Seite des Trägerkörpers (12) vorsteht, und

Bereitstellen eines Drehelements (112) mit zumindest einem Drückbauteil (120), das bewegbar ist, um sich der Seite des Trägerkörpers (12) zu nähern,

Nähern des zumindest einen Drückbauteils (120) der Seite des Trägerkörpers (12), um die Drehschließbewegung an der zweiten Halbschale (C2), die gelenkig (C3) an der ersten Halbschale (C1) angebracht ist, aufzubringen, und

wobei das Drückelement zumindest ein Paar Drückbauteile (120) aufweist, die beim Herstellen der Drehbewegung rittlings der zweiten Halbschale (C2) angeordnet werden können.

Revendications

1. Dispositif pour fermer des récipients (C) comprenant des première (C1) et seconde (C2) demi-coques cupuliformes destinées à être accouplées avec leur partie embouchure respectives en une relation de jonction frontale (C12) en conséquence d'un mouvement de fermeture par retournement amenant ladite seconde demi-coque (C2) agencée latéralement à ladite première demi-coque (C1), à se retourner sur ladite première demi-coque (C1), le dispositif étant **caractérisé en ce qu'**il comprend :

- un corps de support (12) comportant une structure de retenue (14) pour recevoir ladite première demi-coque (C1) d'au moins un desdits récipients (C), ladite seconde demi-coque (C2) étant articulée (C3) sur ladite première demi-coque (C1) et faisant saillie depuis un côté dudit corps de support (12), et
- un élément de retournement (112) comprenant au moins un élément de poussée (120) pouvant être actionné sélectivement pour avancer vers ledit côté du corps de support (12) afin de communiquer à ladite seconde demi-coque (C2), articulée (C3) sur ladite première demi-coque (C1), ledit mouvement de retournement pour fermer le récipient, et

ledit élément de poussée comprenant au moins une paire d'éléments de poussée (120) aptes à être agencés à cheval sur ladite seconde demi-coque (C2) lors de la production dudit mouvement de retournement.

2. Dispositif selon la revendication 1, dans lequel ledit corps de support (12) définit un plan commun pour que les parties embouchures desdites première demi-coque (C1) et seconde demi-coque (C2) se situent dans ce plan lorsque ladite seconde demi-coque (C2), articulée (C3) sur ladite première demi-coque (C1), fait saillie depuis un côté dudit corps de support (12) et en ce que ledit au moins un élément de poussée (120) est mobile pour se rapprocher dudit côté dudit corps de support (12) et dudit plan commun défini par ledit corps de support (12) suivant une trajectoire angulaire (α) par rapport audit plan commun défini par ledit corps de support (12).

3. Dispositif selon la revendication 1 ou la revendication 2, dans lequel ledit au moins un élément de poussée (120) a la forme d'un doigt.

4. Dispositif selon l'une quelconque des revendications 1 à 3, dans lequel ledit élément de poussée comprend au moins une tige façonnée pour recevoir au moins une partie de ladite seconde demi-coque (C2).

5. Dispositif selon l'une quelconque des revendications précédentes, dans lequel :

- ledit corps de support (12) comprend une pluralité de structures de retenue (14) pour une pluralité correspondante de récipients (C), et
- ledit élément de retournement (112) comprend un agencement (120) d'éléments de poussée destinés à coopérer avec ladite pluralité de récipients (C).

6. Dispositif selon l'une quelconque des revendications précédentes, comprenant un élément de fermeture final (114) comprenant au moins un élément de pression (140) pouvant être actionné pour avancer vers ledit corps de support (12) afin de consolider la seconde demi-coque (C2) dans sa position fermée retournée sur une première demi-coque (C1) correspondante.

7. Dispositif selon la revendication 6, dans lequel ledit au moins un élément de pression (140) présente une forme généralement concave, de préférence en V.

8. Dispositif selon la revendication 5 et l'une des revendications 6 ou 7, dans lequel ledit élément de fermeture final (114) comprend une pluralité desdits éléments de pression (140) destinés à agir sur des récipients (C) respectifs dans ladite pluralité.

9. Procédé de fermeture de récipients (C) comprenant des première (C1) et seconde (C2) demi-coques cupuliformes destinées à être accouplées avec leur partie embouchure respectives en une relation de jonction frontale (C12) en conséquence d'un mouvement de fermeture par retournement amenant ladite seconde demi-coque (C2) articulée (C3) sur, et agencée latéralement à, ladite première demi-coque (C1), à se retourner sur ladite première demi-coque (C1), le procédé comprenant les étapes consistant à :

- agencer ladite première demi-coque (C1) d'un desdits récipients (C) dans un corps de support (12) comportant une structure de retenue (14) pour la première demi-coque (C1), ladite seconde demi-coque (C2), articulée (C3) sur ladite première demi-coque (C1), faisant saillie depuis un côté dudit corps de support (12), et
- prévoir un élément de retournement (112) comprenant au moins un élément de poussée (120) mobile pour avancer vers ledit côté du corps de support (12),
- faire avancer ledit au moins un élément de poussée (120) vers ledit côté du corps de support (12) afin de communiquer ledit mouvement de retournement à ladite seconde demi-coque (C2) articulée (C3) sur ladite première demi-coque (C1), et

ledit élément de poussée comprenant au moins une paire d'éléments de poussée (120) aptes à être agencés à cheval sur ladite seconde demi-coque (C2) lors de la production dudit mouvement de retournement.

FIG. 1

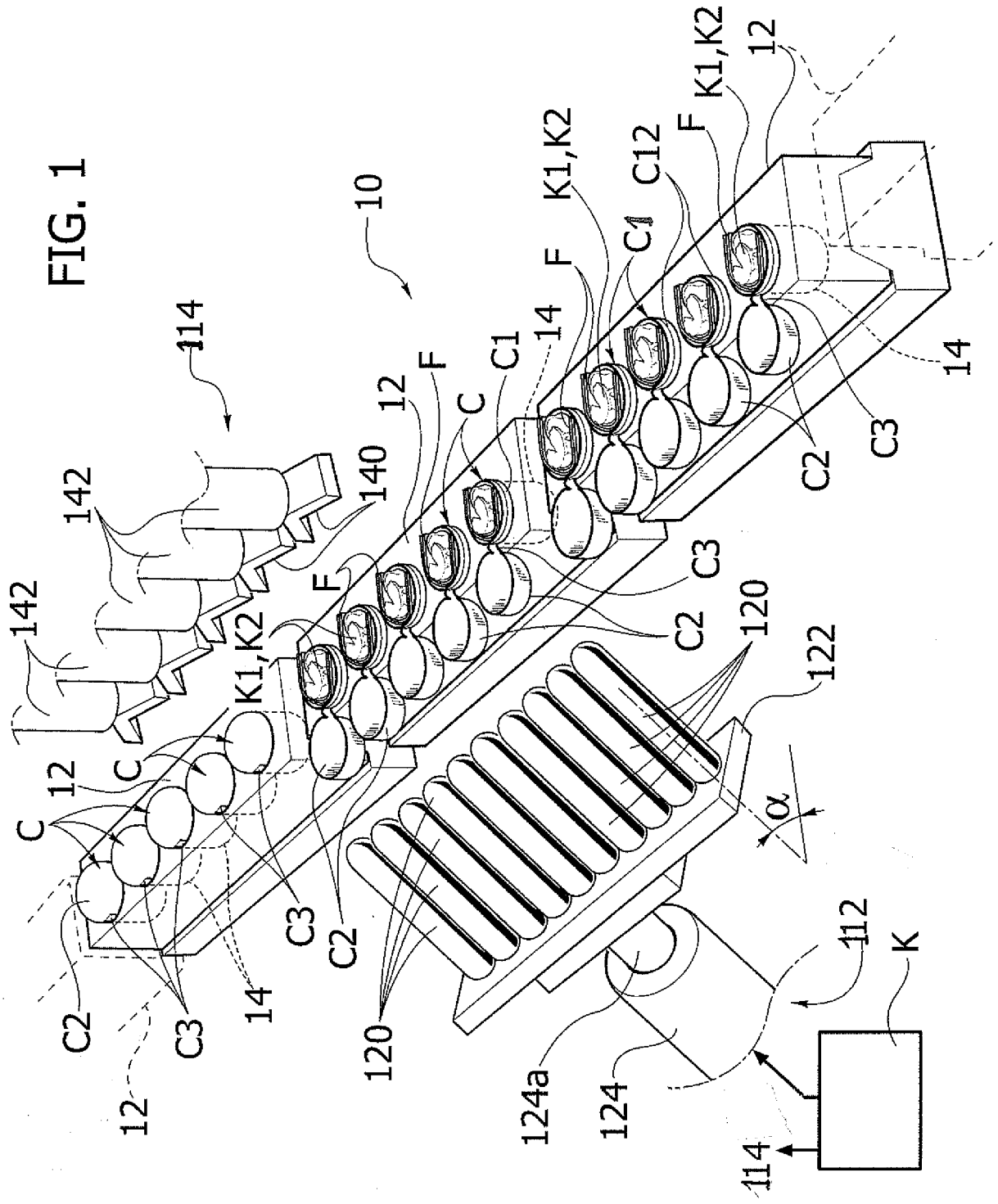


FIG. 2

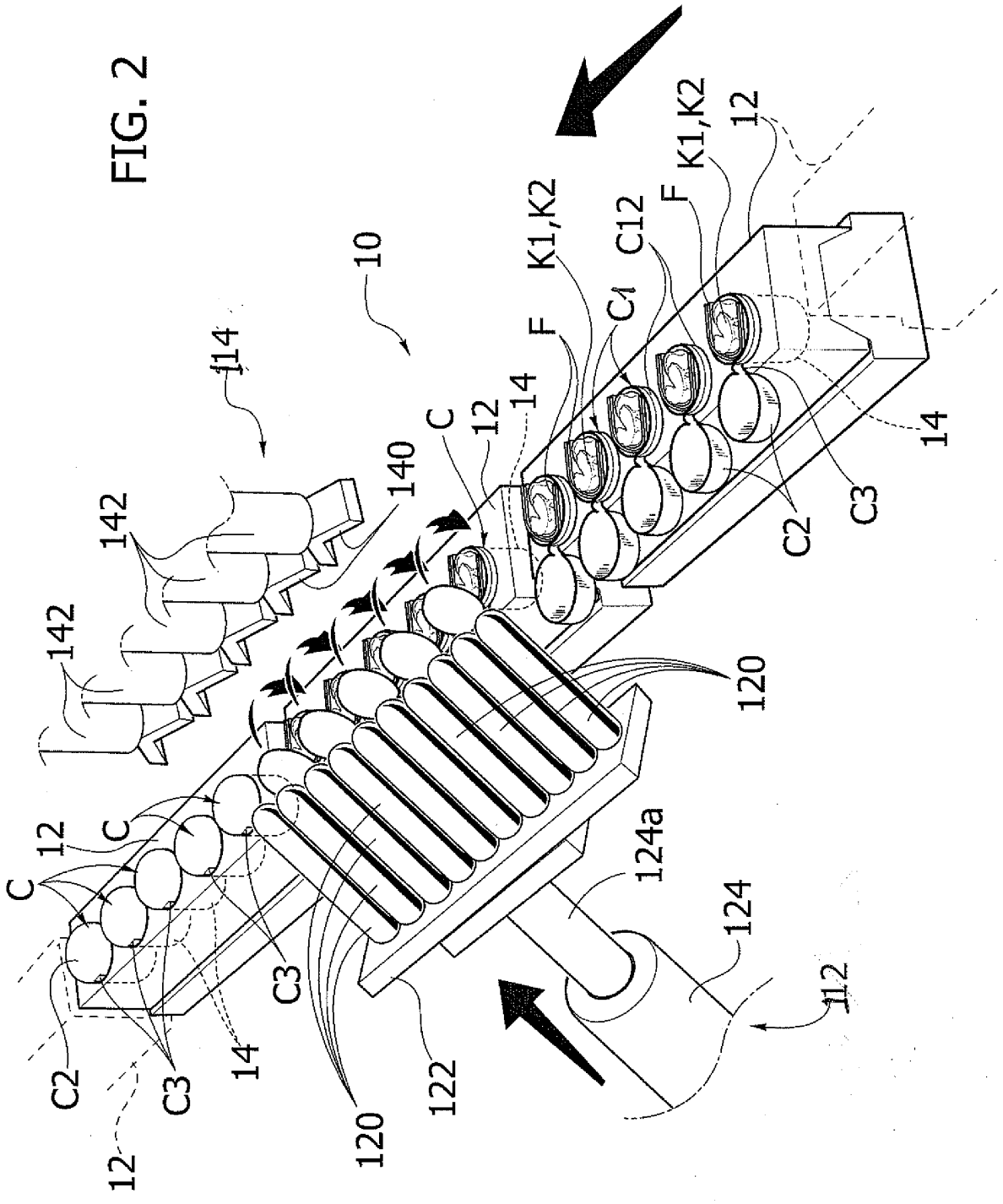

10
114
142
142
140
C
12
14
F
K1,K2
C1
C12
F
K1,K2
12
14
C2
C3
120
124a
124
112
122
120
C3
14
C3
C2
12
C
12
C

FIG. 3

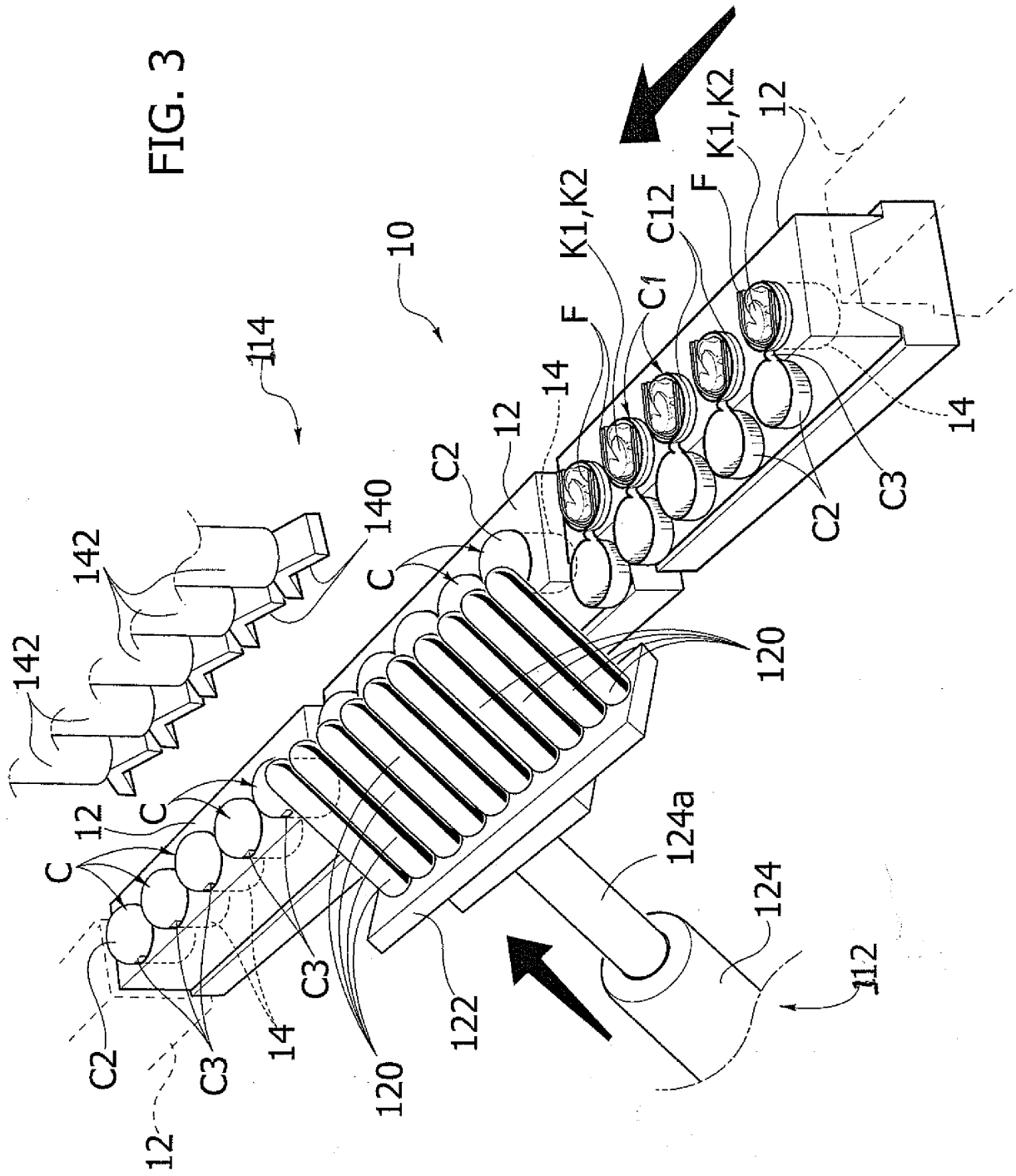
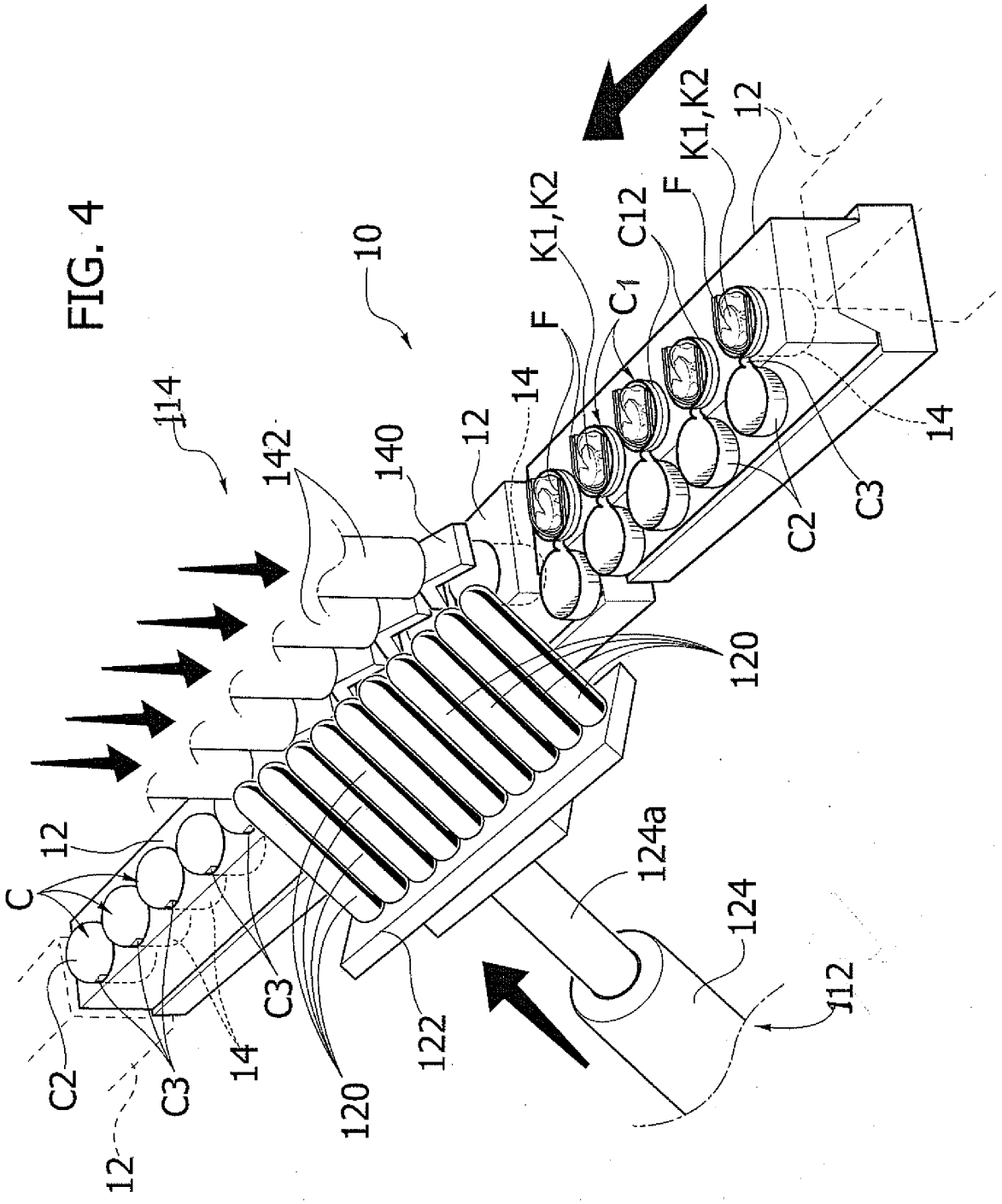

10
114
142
142
140
C
C
C
12
12
12
12
C2
C2
C2
C2
C3
C3
C3
C3
14
14
14
14
120
120
122
124a
124
112
K1,K2
K1,K2
F
F
C1
C12

FIG. 4


10
114
142
140
12
14
F
K1,K2
C1
C12
F
K1,K2
12
14
C2
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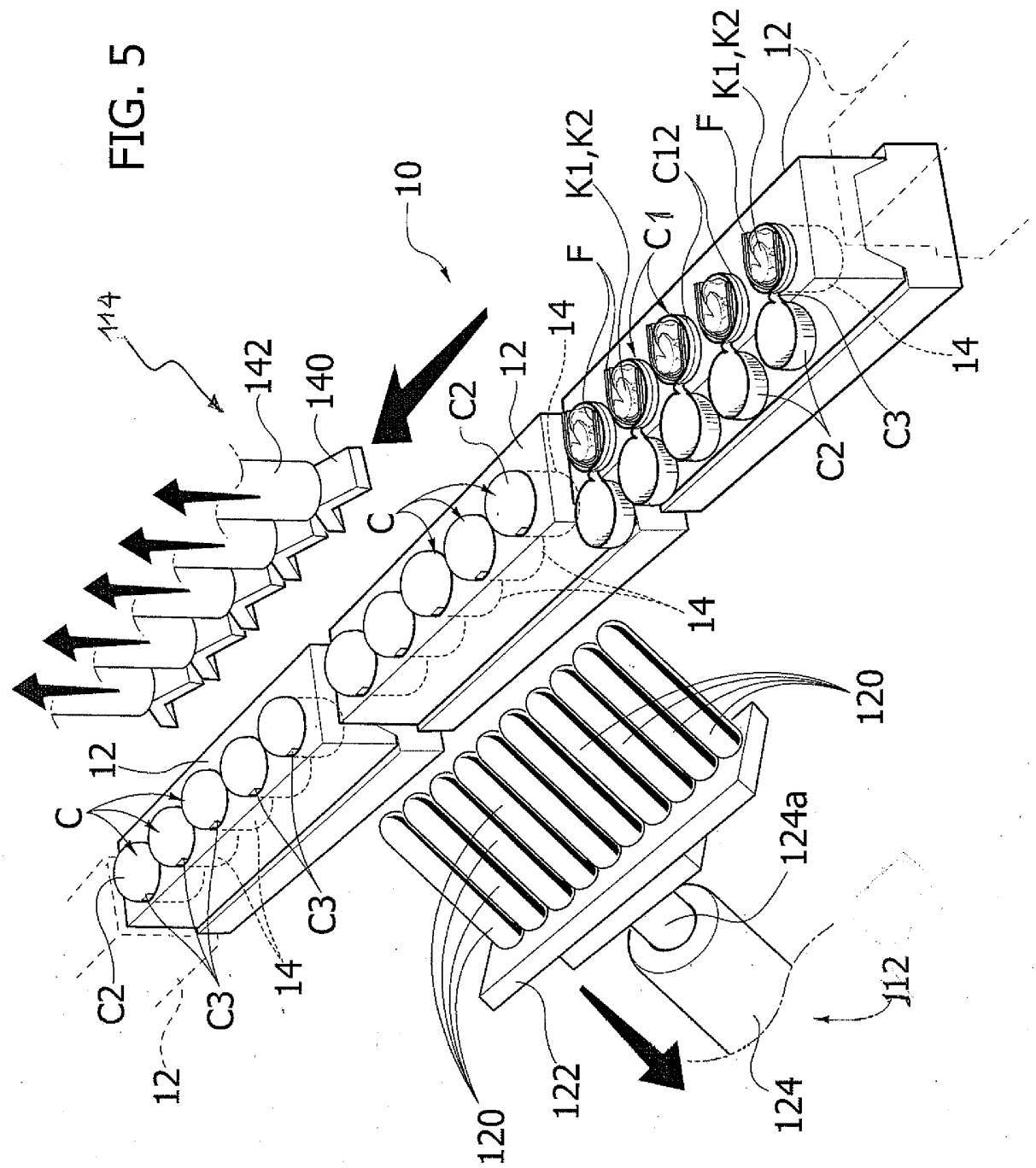
14
C3
120
122
124a
124
112
12

FIG. 5



REFERENCES CITED IN THE DESCRIPTION

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