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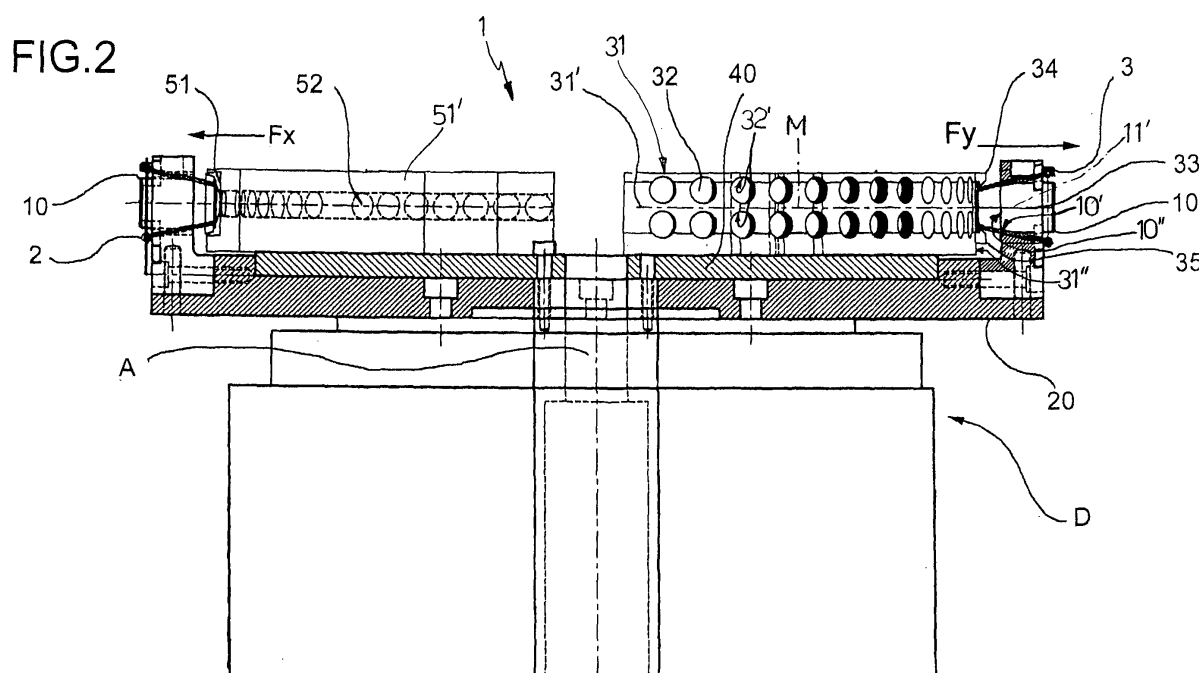
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(54) **Axial-clamping assembly for the production of cages for tops for spumante wine bottles or the like**

(57) *Described herein is an axial-clamping assembly (1) for the production of cages (2) for tops for spumante wine or the like associated to a rotary table (20) turning about an axis (A) of rotation, and provided with a supporting body (40) mounted in a fixed position with respect to the rotary table (20), and with a plurality of cups (10) fixed to the rotary table (20) and having respective re-*

cesses (11) designed to receive a corresponding cage (2); a guide (31) being set on the supporting body (40) in a radially front position inside said cups (10) and at a constant radial distance from the cups (10) themselves, and being provided with magnetic elements (32) for attracting each cage (2) radially towards the axis (A) of rotation, thus clamping the cage (2) itself within the corresponding recess (11).



Description

[0001] The present invention relates to an axial-clamping assembly for the production of cages for tops for spumante wine or the like.

[0002] The purpose of the present invention is to provide an axial-clamping assembly for the production of cages for tops for spumante wine or the like which will prevent any kind of sliding of or damage to the cage during its translation or movement from one processing station to another.

[0003] The present invention achieves the aforesaid purpose by means of an axial-clamping assembly for the production of tops for spumante wine or the like presenting the characteristics recalled specifically in the ensuing claims.

[0004] Before entering into the merits of the ensuing description, it is to be pointed out that machines for the production and movement of cages for tops for spumante wine or the like in general have rather complex structures made up of numerous devices for movement of the cages from one workstation to another, and comprise a rotary table and a plurality of clamping devices provided with housings for cages set on the rotary table, and with fixed support against which the cages must slide in order not to be expelled in any way from the housings as a result of the centrifugal force due to rotation of the rotary table.

[0005] Complete systems for the movement of cages for tops for spumante wine or the like are described, for example, in the Italian patent applications Nos. MI2003A001501 and MI2003A001502, to which the reader is referred for the constructional details.

[0006] The invention will now be described, purely by way of non-limiting example, with reference to the attached plate of drawings in which:

Figure 1 represents, in side elevation and with parts in cross-sectional view and parts removed for reasons of clarity, a machine for making cages for tops for spumante wine provided with a preferred embodiment of an axial-clamping assembly according to the invention in side view;

Figure 2 represents the axial-clamping assembly according to the invention in side view;

Figure 3 represents the assembly of Figure 2 in plan view;

Figures 4 to 8 are enlarged views of details of Figures 2 and 3.

[0007] With reference to the annexed figures, designated, as a whole, by 1 is an axial-clamping assembly for the production of cages 2 for tops for spumante wine or the like.

[0008] The assembly 1 is associated to a rotary table 20 designed to be set in rotation about an axis A of rotation by a device D, which is in itself known and does not have any bearing upon the present invention, and comprises a fixed body 40, which is positioned axially above

the rotary table 20 and is immobile with respect to the rotary table 20 itself.

[0009] The assembly 1 moreover comprises a plurality of cups 10, which are uniformly distributed about the axis A and, as also illustrated in Figure 4, are fixed along the periphery of the rotary table 20 by means of screws 12 with hexagonal heads. Each cup 10 is provided with a respective substantially circular opening 10' made through a surface 10", radially facing the axis A, of the cup 10 itself, and is moreover provided with a respective recess 11, which substantially has the shape of a truncated cone increasing radially on the opposite side with respect to the axis A, has a respective axis 11' of processing lying in a radial direction towards the axis A and transverse thereto, and is designed for housing the body 3 of a cage 2 so that the four legs 4 of the body 3 are inclined by 45° with respect to the axis 11' of processing and so that an annular head 5 of the cage 2 comes out of the opening 10' by a given amount, any radial displacement in the direction of the axis A of the cage 2 itself being at the same time prevented.

[0010] As is also illustrated in Figure 3, during rotation of the rotary table 20 about the axis A, each cup 10 is designed to cause advance of the cages 2 along a path P which extends through an insertion and torsion assembly 60, an unloading station S, set downstream of the assembly 60 along the path P, and a station C, set in a position intermediate between the insertion and torsion assembly 60 and the station S. During said rotation, moreover, the assembly 1 is designed to keep each body 3 in the corresponding cup 10 in a position of conveyance, preventing it from coming out owing to the centrifugal force exerted on the body 3 itself and following upon rotation of the table 20. In other words, the assembly 1 is designed to prevent, by means of the recesses 11 and their particular truncated-cone shape, a displacement of the cages 2 towards the axis A and along the axis 11' and, as will be described in greater detail in what follows, is likewise designed to prevent also any displacement of the cages 2 once again along the axis 11' in a direction opposite to the axis A, consequently ensuring maintenance of the position of conveyance of each cage 2 within its own recess 11.

[0011] The assembly 1 moreover comprises a guide 31, mounted on the fixed body 40 and defined by a cylindrical wall 31', which extends about the axis A throughout an arc of amplitude substantially of 180° terminating in a position corresponding to the station C, and is radially delimited outwards by a surface 31" facing the surfaces 10" of the cups 10.

[0012] The cylindrical wall 31' is provided with a plurality of pairs of seats 32', uniformly distributed about the axis A and housed within each of which is a magnetized body or permanent magnet 32. The seats 32' of each pair of seats 32' are set in a position symmetrical with respect to a horizontal median line M of the guide 31 identified by the intersection of the axes 11' of processing with the cylindrical wall 31'.

[0013] The guide 31, i.e., its own surface 31", is set, throughout its arc of 180°, at a constant radial distance from the surfaces 10" of the cups 10 and, in any case, at a distance such that the annular head 5 of the cages 2 is always set in the radial space comprised between the surfaces 31" and 10" in all the points of rotation in order to prevent any possible sliding and friction of the annular heads 5 against the guide 31.

[0014] The force exerted by the magnetized bodies 32 on the annular heads 5 is designed to overcome the centrifugal force caused by the rotation of the rotary table 20 and enables the bodies 3 of the cages 2 to be kept in their position of conveyance, with the legs 4 set within the corresponding recess 11 and with the annular head 5 set just outside of the recess 11 through the window 10', likewise enabling advance of the cages 2 to the subsequent workstations.

[0015] Fixed on the assembly 1, at 90° from the start of the guide 31 and consequently at 90° upstream of the station C along the path P, is a mechanical anchorage 33 comprising a top tab 34 and a bottom tab 35, set in a point corresponding to the processing and torsion assembly 60, where the girdle or brace 7 is inserted in the body 3 of the cage 2.

[0016] The mechanical anchorage 33 is necessary since during return into the position of rest of the assembly 60 for insertion and torsion of the girdle or brace 7, with the rotary table 20 stationary, the force F_y directed outwards from the table 20 is much greater than the centrifugal force F_x produced by the table 20 itself in rotation. In fact, the assembly 60 that comes out after processing exerts on the body 3 of the cage 2 a force much greater than the centrifugal force that originates on the cage 2 during rotation of the table 20.

[0017] The system of mechanical anchorage 33 equipped with tabs 34, 35 enables the body 3 of the cage 2 to remain in position on the cup 10 during movement towards the point of rest of the assembly 60 for insertion of the girdle or brace 7, enabling rotation of the table 20.

[0018] This being said, the assembly 1, on account of the force exerted by the magnetized elements 32, overcomes in a relatively easy way the centrifugal force F_x but is unable to overcome the force F_y exerted mechanically by the moving assembly 60. From the foregoing, it emerges that the annular head 5 of the cage 2 is in contact with the tabs 34, 35 of the system of mechanical anchorage 33 so as to overcome a force F_y directed outwards.

[0019] It should be emphasized that the system of mechanical anchorage 33 is present in just one point of the guide 31 to prevent any squeezing during the step of rotation of the table 20. Once each cage 2 has been equipped with the corresponding girdle or brace 7, it is fed through the station C, in a position corresponding to which the cap 6 is inserted in the corresponding body 3, after which, in step-by-step fashion, each cage 2 is made to advance through an arc of amplitude of approximately 90° up to the station S to enable it to be unloaded from the table 20 onto another table (not described or represented), where the operations prior to packaging proceed.

sented), where the operations prior to packaging proceed.

[0020] Finally, the assembly 1 comprises a further guide 51, which is mounted on the fixed body 40 between the stations C and S and is defined by a respective cylindrical wall 51', which extends about the axis A for an arc of amplitude substantially of approximately 90°, and is radially delimited outwards by a surface 51" facing the surfaces 10" of the cups 10. The cylindrical wall 51' is moreover provided with a plurality of seats 52' uniformly distributed about the axis A and within each of which a magnetized body or permanent magnet 52 is housed, designed to exert a force greater than the centrifugal force to which each cage 2 is subjected during rotation of the rotary table 20 between the stations C and S.

[0021] The seats 52' are set in a substantially aligned position in a respective radial direction with respect to the openings 10' of the cups 10, i.e., they are set along the median line M of the guide 51, whilst the guide 51, i.e., its own surface 51", is set, throughout its arc of 90°, at a constant radial distance from the surfaces 10" of the cups 10 and, in any case, at a distance such that the cap 6 of the cages 2 is once again set in the radial space comprised between the surfaces 51" and 10" in all the points of rotation in order to prevent any possible sliding and friction of the caps 6 against the guide 51.

[0022] The prevention of any sliding or contact of the caps 6 against the guide 51 enables prevention of any scratching of the cap 6 in any of its parts, preserving the integrity thereof up to the end of rotation.

[0023] From the foregoing, it emerges evident that, in the stretch of path P corresponding to the guide 51, the magnetized bodies 52 exert on the caps 6 of the cages 2 a force of magnetic attraction, the main component of which is directed along each axis 11' and is designed to counter the effect of the centrifugal force on each cage 2 due to the rotation of the rotary table 20. Instead, since along the stretch of path P corresponding to the guide 31, the cages 2 are without the corresponding caps 6, it is necessary to have available a plurality of magnetized bodies 31 set above the median line M and schematically acting on a top portion of the annular heads 5, and a plurality of magnetized bodies 31 set beneath the median line M and schematically acting on a bottom portion of the annular heads 5: the simultaneous magnetic action of the magnetized bodies 31 or each pair of magnetized bodies 31 results in a force of magnetic attraction directed in any case along each axis 11' and designed to counter the effect of the centrifugal force on each cage 2 owing to the rotation of the rotary table 20.

[0024] It should be emphasized that the presence of the magnetic bodies 32 and 52 enables attraction towards the axis A of the cages 2 set within the recesses 11, thus axially clamping along each axis 11' the cages 2 themselves without either the annular heads 5 or the caps 6 having to come into contact with other elements, to the total advantage of the integrity of the cages 2 themselves.

[0025] Furthermore, the possibility of clamping each cage 2 within the corresponding recess 3, overcoming the centrifugal forces due to the rotation of the cage 2 itself, without using any element in contact with the cage 2 or the corresponding cap 6, enables the use also of caps painted in an anonymous way or silk-screen printed with the writings and symbols of the bottling firm.

[0026] Of course, without prejudice to the principle of the invention, extensive variations may be made to what is described and illustrated herein, without thereby departing from the sphere of protection of the invention itself.

Claims

1. An axial-clamping assembly (1) for the production of cages for tops for spumante wine or the like, the assembly (1) being associated to a rotary table (20) turning about an axis (A) of rotation for the advance of the cages along a production path (P), and comprising:

- a supporting body (40), mounted in a fixed position with respect to the rotary table (20); and
- a plurality of cups (10), fixed to the rotary table (20) and having respective recesses (11) designed to receive a corresponding cage (2);

said assembly (1) being **characterized in that** it comprises a first guide (31) (51), which is set on the supporting body (40) in a radially front position inside said cups (10) and at a constant radial distance from the cups (10) themselves, and is provided with magnetic means (32) (52) for attracting each cage (2) radially towards the axis (A) of rotation, thus clamping the cage (2) itself within the corresponding recess (11).

2. The assembly according to Claim 1, **characterized in that** said first guide (31) (51) has a radially external surface (31'') (51'') facing said cups (10) and set at a constant radial distance from the cups (10) themselves throughout its extension about the axis (A) of rotation, i.e., at a distance such that an annular head (5) or a cap (6) of each cage (2) are always set in a radial space comprised between the external surface (31'') (51'') and the cups (10) in order to prevent any possible sliding and friction of the annular heads (5) or of the caps (6) against the first guide (31) (51).

3. The assembly according to Claim 2, **characterized in that** said magnetic means (32) (52) are defined by a plurality of magnetized elements and/or permanent magnets (32) (52) distributed along said first guide (31) (51).

4. The assembly according to Claim 3, **characterized**

in that said first guide (31) (51) is provided with a plurality of seats (32') (52') uniformly distributed about said axis (A) for housing said magnetic means (32) (52).

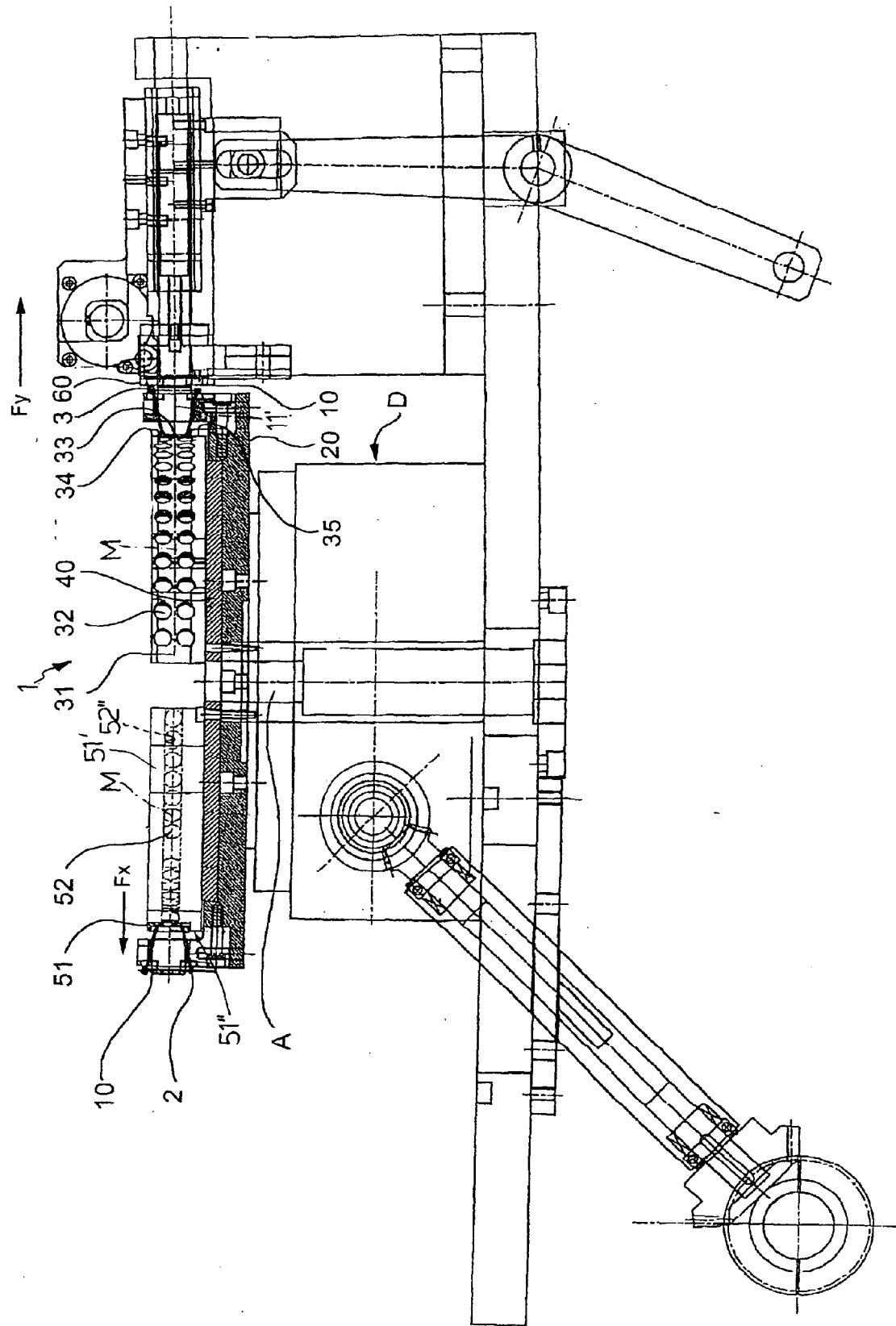
5. The assembly according to Claim 4, **characterized in that** said seats (32') are set in pairs of vertical seats (32'), in which the seats (32') of each pair of seats (32') are set in a position symmetrical with respect to a horizontal median line (M) of the guide (31) determined by the intersection of the axes (11') of processing of each recess (11) with the guide (31) itself.

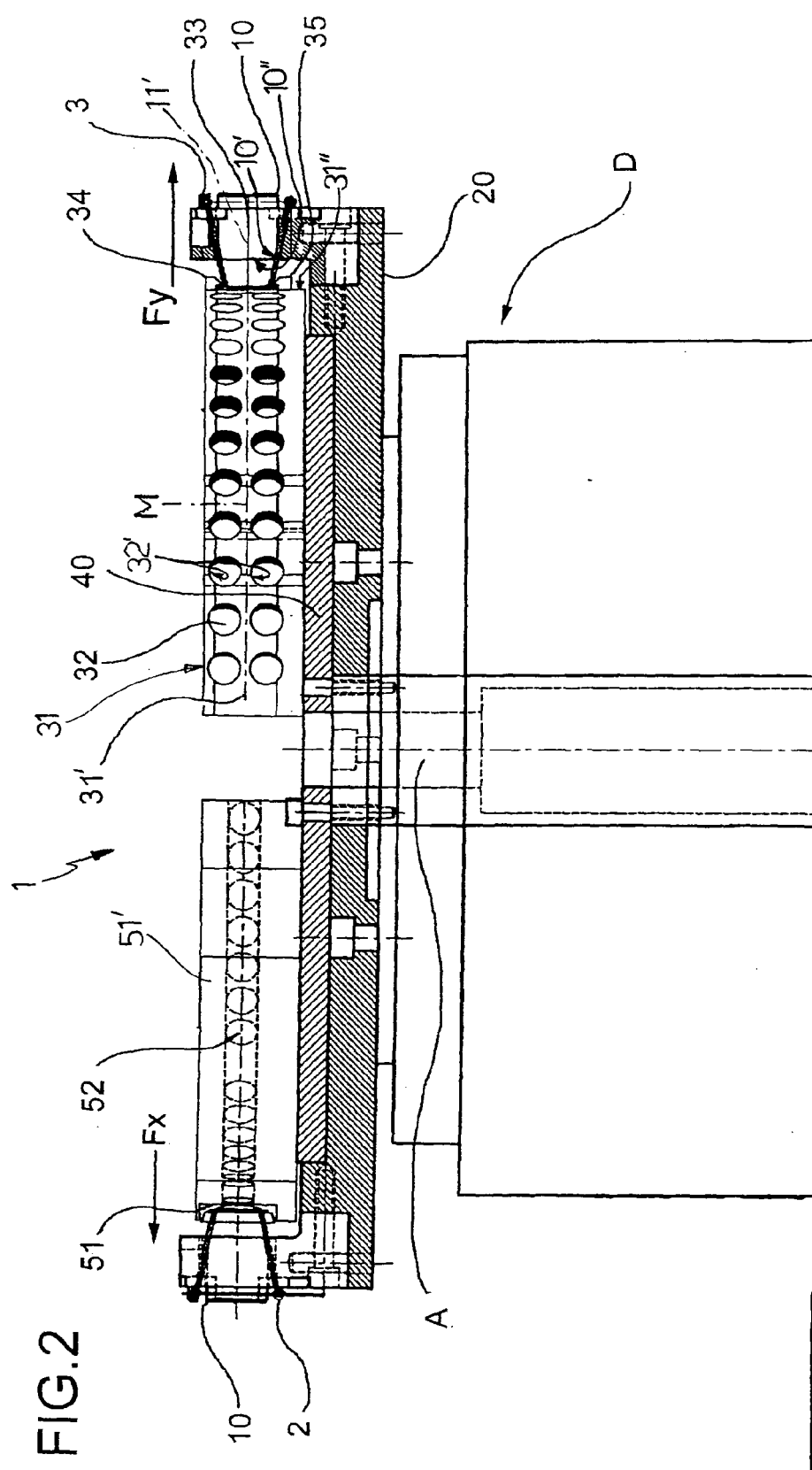
6. The assembly according to Claim 4, **characterized in that** it comprises a second guide (51) (31), which is set on the supporting body (40) in a radially front position inside said cups (10) and at a constant radial distance from the cups (10) themselves; the second guide (51) (31) being set downstream of said first guide (31) (51) with respect to the direction of rotation of said rotary table (20).

7. The assembly according to Claim 6, **characterized in that** said seats (52') are set along a horizontal median line (M) of the guide (51) determined by the intersection of the axes (11') of processing of each recess (11) with the guide (51) itself.

8. The assembly according to any one of the preceding claims, **characterized in that** it presents, at 90° from the start of said first guide (31), a mechanical anchorage (33) comprising a top tab (34) and a bottom tab (35).

FIG. 1





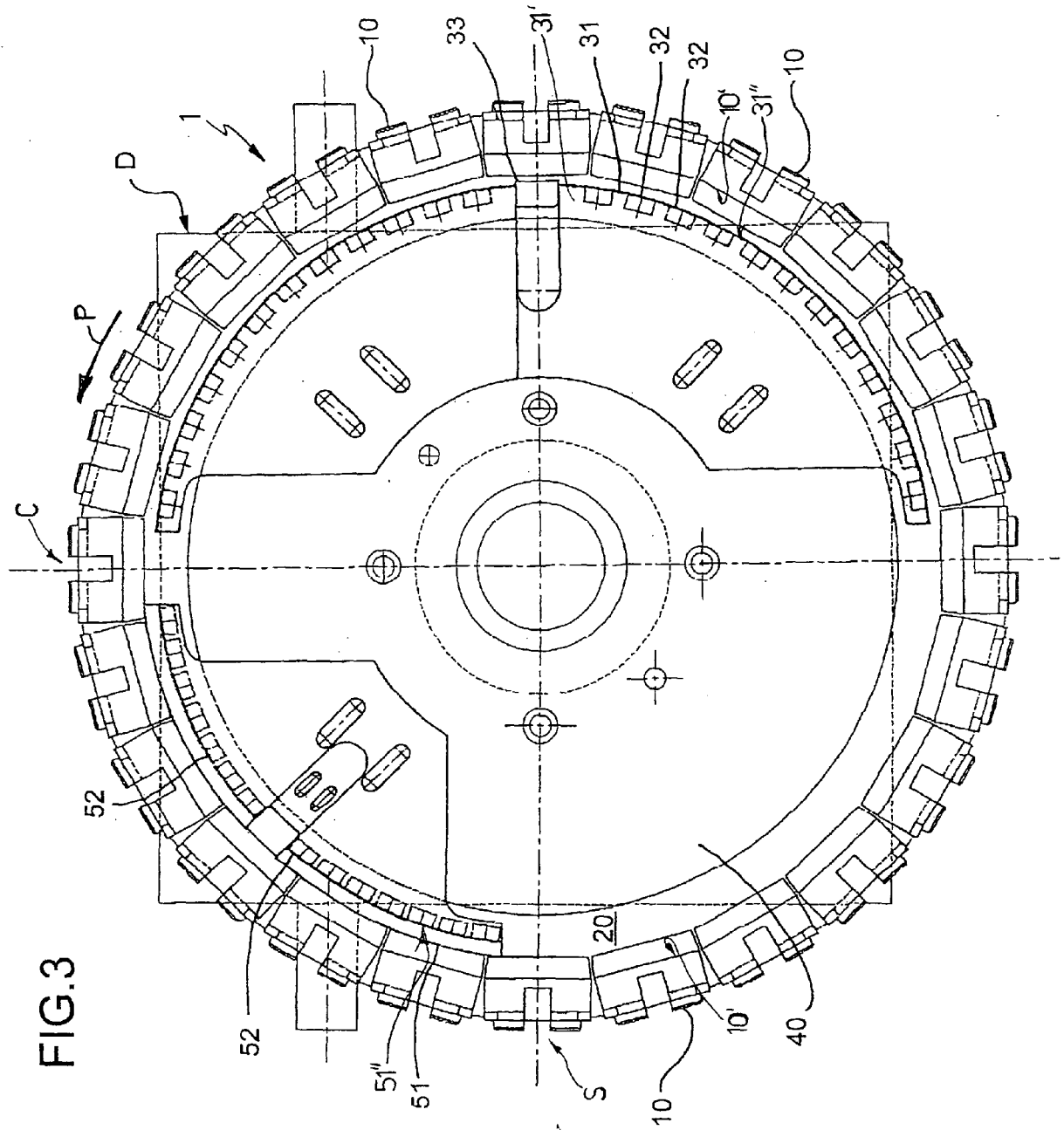


FIG.4

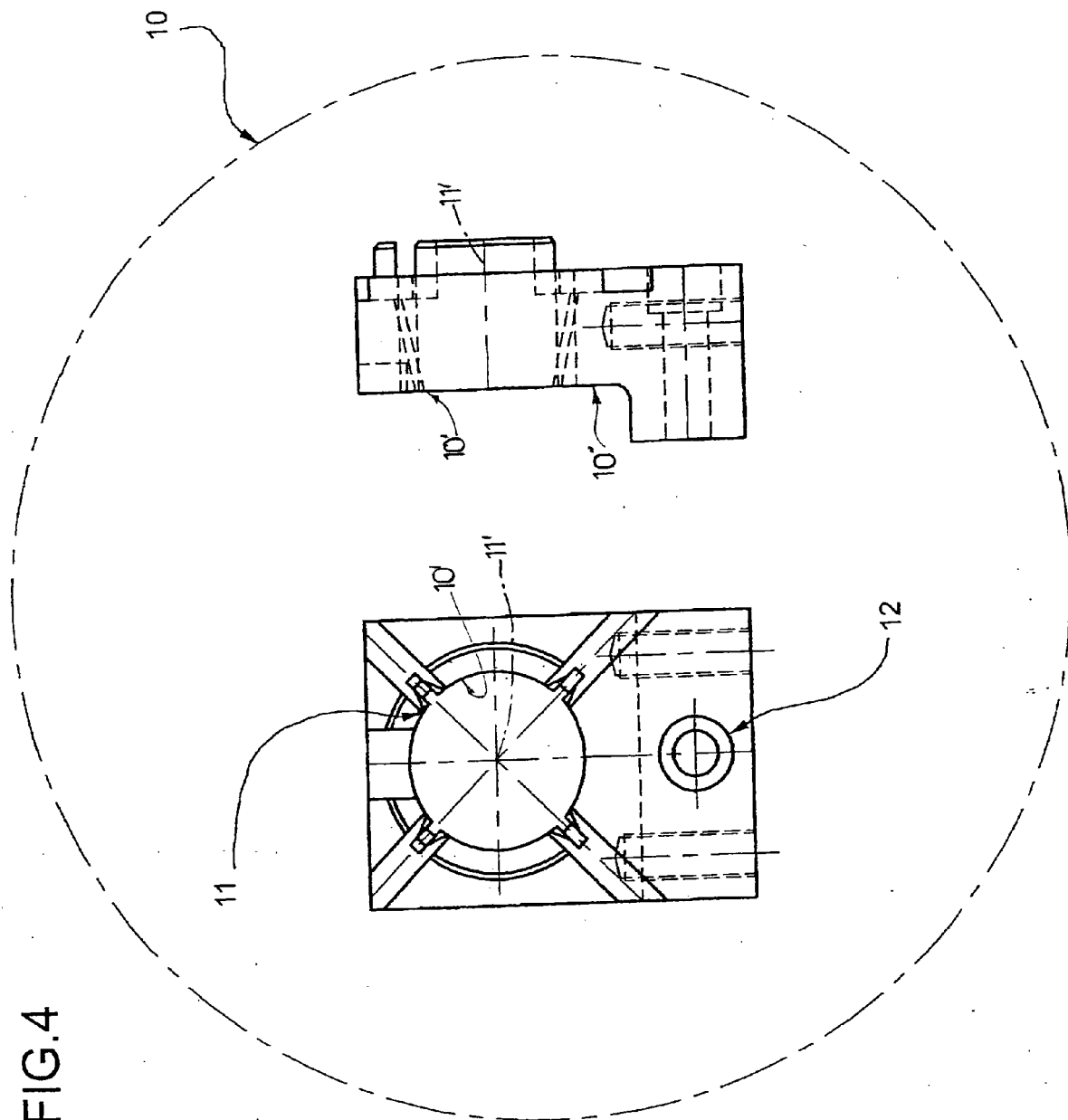


FIG.5

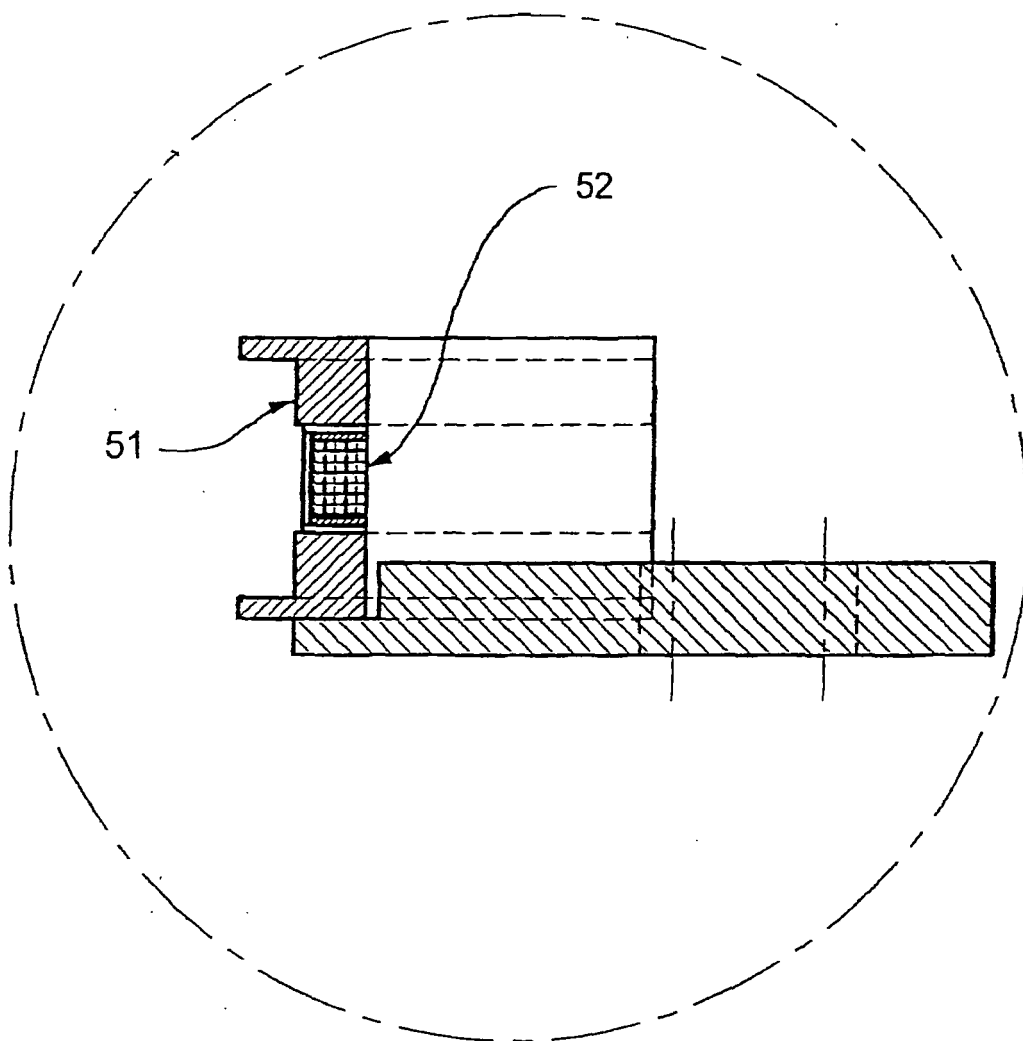


FIG.6

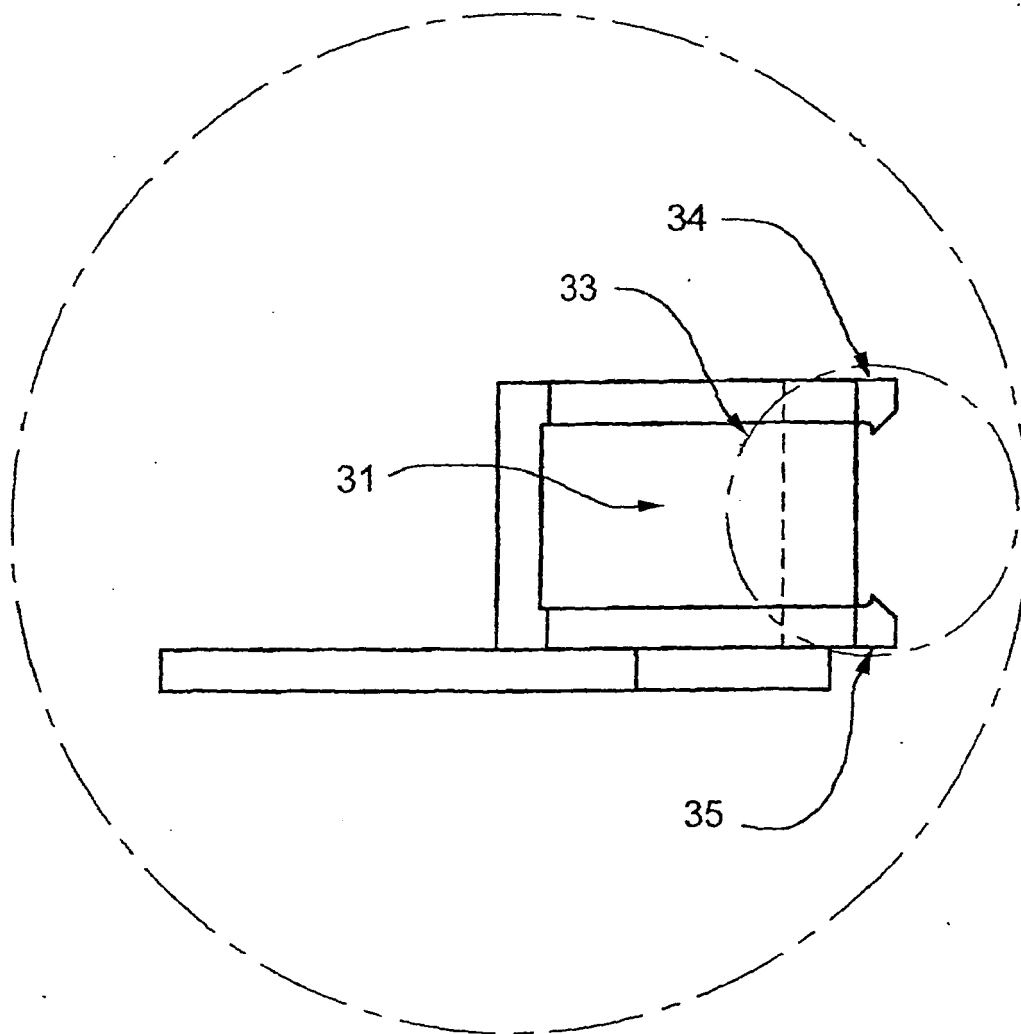


FIG.7

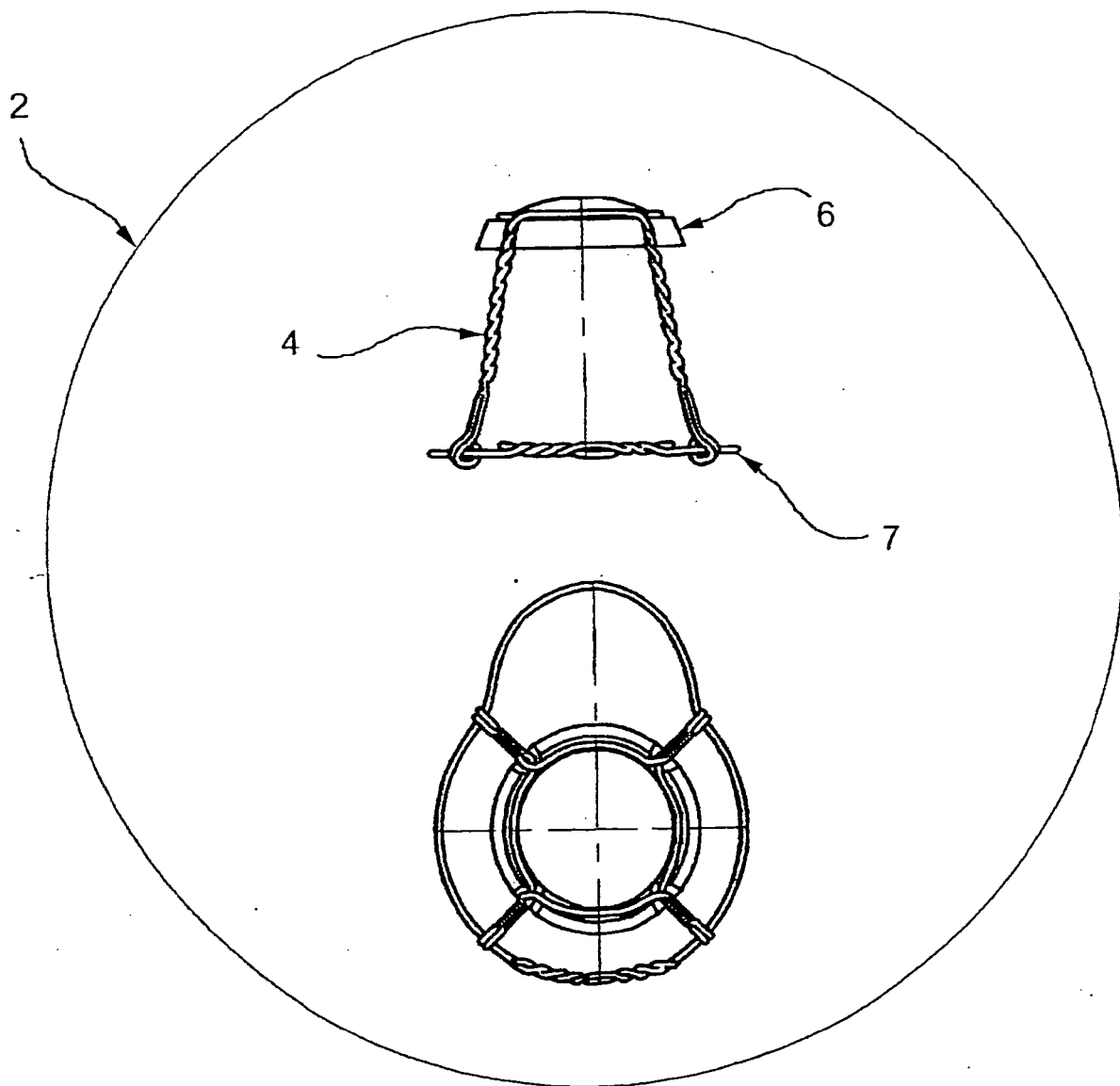
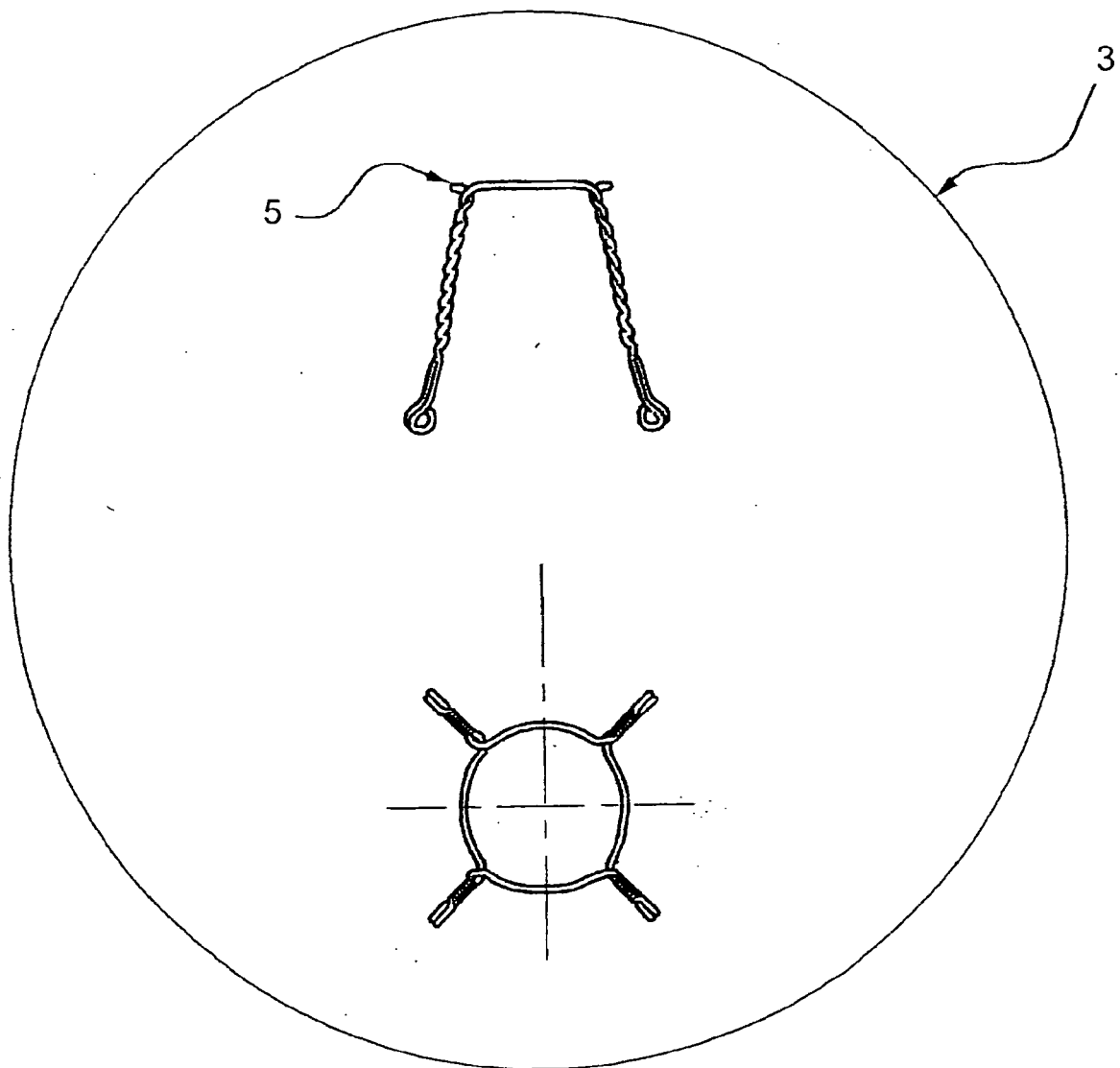


FIG.8





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 00 6568

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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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