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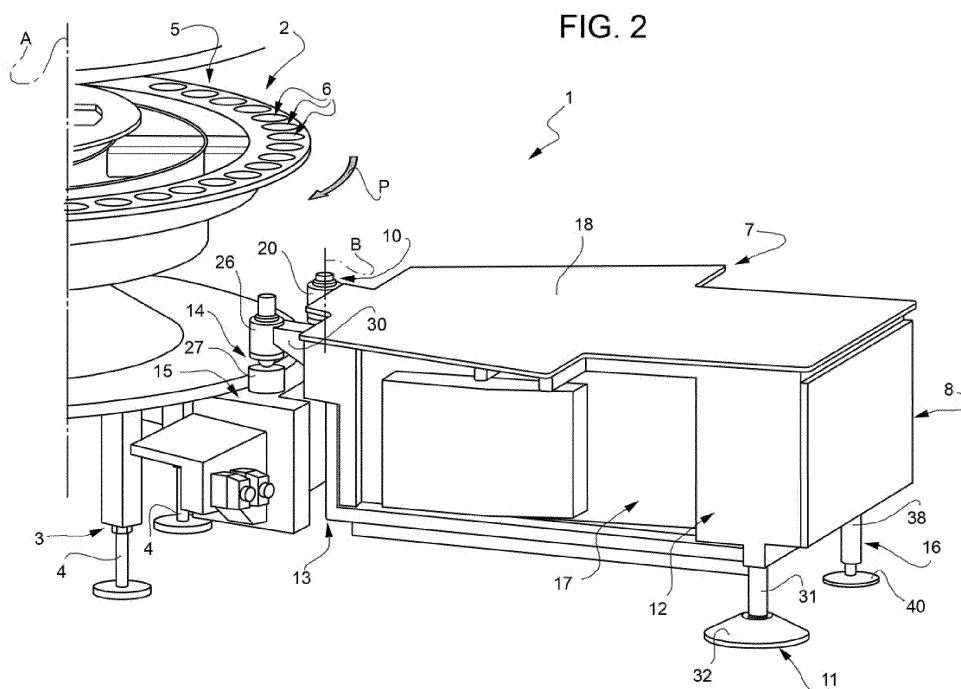
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(54) **Labelling machine**

(57) The invention relates to a labelling machine (1) for applying labels on respective items, in particular containers or the like, comprising a carousel (2) rotating about a first vertical axis (A) and peripherally bearing a plurality of items, and a labelling station (7) arranged peripherally with respect to the carousel (2) and adapted to feed labels to the carousel (2); the machine (1) also comprises:

constraint hinge means (10) arranged at the periphery of the carousel (2) and connecting the labelling station (7) to the carousel (2) in an orientable manner about a second axis (B) parallel to said first axis (A); and fastening means (11) of the labelling station (7) to the ground in a predetermined position with respect to the carousel (2), these fastening means (11) are arranged at a predetermined distance other than zero from the periphery of the carousel (2).



Description

[0001] The present invention relates to a labelling machine for applying labels on respective items, in particular containers, bottles or the like, to which the following description will explicitly refer without because of this loosening in generality. More in particular, the present invention relates to a labelling machine for applying labels on respective containers fed along a predetermined path within a bottling system for liquid or powder products.

[0002] As is known, in labelling machines, all essential units (carousel, conveyor belts, labelling stations for feeding labels to the carousel, etc.) are typically placed on a common table structure, which substantially forms the support of the machine. This kind of configuration results particularly bulky and therefore limits accessibility to the single units, accordingly making the maintenance and cleaning of the apparatuses complex.

[0003] To partly overcome the above mentioned drawbacks, German patent application n. DE-A-3134661 has for example suggested to use a reduced size table structure supporting:

- a centrally positioned carousel;
- an inlet star wheel to feed the containers to be labelled to the carousel;
- an outlet star wheel to remove the labelled containers from the carousel; and
- a labelling station for feeding the labels to the carousel.

[0004] However, despite the suggested reduction in size, the table structure still required in this kind of solution is still quite bulky and expensive. Furthermore, this solution is poorly flexible in view of subsequent modifications to the overall configuration of the machine, which are typically required in the field, for example to comply with new production needs, variations in size and/or shape of the containers, etc. It should also be taken into account that considerably modifying the overall configuration of a labelling machine is often so expensive that it is preferable to totally replace the machine itself.

[0005] To overcome the above disclosed problems, EP-B-1412279 has suggested to make the labelling station self-supporting, i.e. provided with a support structure of its own that can be rested directly on the ground, and to constrain it to the periphery of the carousel. In particular, it has been suggested to provide the fastening of the relative position of the labelling station to the carousel only by a plurality of constraint elements arranged to the periphery of the carousel.

[0006] The suggested solution improves accessibility to the various parts of the machine and results less bulky with respect to the solution with a common table structure on which all the essential units of the machine are fastened. Furthermore, this solution has a good flexibility in view of subsequent modifications of the overall configuration of the machine.

[0007] It should also be noted that because the above cited solution requires the rigid connection between the labelling station and the carousel in several positions in order to lock the labelling station in a well determined position with respect to the carousel, it requires very restrictive coupling tolerances between the parts to be connected with subsequent relatively high costs for manufacturing the whole machine.

[0008] Furthermore, for the same reasons, the assembly between the labelling station and the carousel can result complicated, as it requires the simultaneous coupling of the parts to be connected in several positions.

[0009] It is an object of the present invention to therefore provide a labelling machine for applying labels on respective items, in particular containers or the like, which allows to overcome, in a simple and cost-effective manner, the above mentioned drawbacks connected with the labelling machines of the known type and results in particular highly flexible, cost-effective, easily assembleable and accessible in every part.

[0010] The abovementioned object is achieved by the present invention because it relates to a labelling machine as defined in claim 1.

[0011] A preferred embodiment is hereinafter disclosed for a better understanding of the present invention, by mere way of non-limitative example and with reference to the accompanying drawings, in which:

- figure 1 shows a top view with parts removed for clarity of a labelling machine according to the dictates of the present invention;
- figure 2 shows a perspective view on an enlarged scale of the labelling machine of figure 1 with parts removed for clarity;
- figure 3 shows a top view with parts removed for clarity of the labelling machine of figures 1 and 2 during assembly; and
- figures 4 to 7 show perspective views on an enlarged scale of some details of the labelling machine of figures 1 to 3.

[0012] In figures 1 to 3, numeral 1 indicates as a whole a labelling machine for applying labels (known per se and not shown) on respective items, in particular containers, bottles or the like (also known per se and not shown).

[0013] Machine 1 essentially comprises a carousel 2 adapted to receive the items to be labelled by respective inlet conveyor means (known per se and not shown) to feed them along a path P substantially defined by a circumference arc and transfer them, once labelled, to respective outlet conveyor means (also known per se and not shown).

[0014] Typically, the inlet and outlet conveyor means are formed by respective star wheels.

[0015] Carousel 2 has a vertical axis A and comprises a fixed support frame 3, supported on the ground by a plurality of legs 4, and an operative unit 5 mounted on frame 3 rotating about axis A and provided with a plurality

of peripheral seats 6 for receiving respective items.

[0016] Machine 1 also comprises a labelling station 7 arranged peripherally with respect to carousel 2 and adapted to feed labels to be applied on the respective items to carousel 2.

[0017] In particular, labelling station 7 comprises a support frame 8 and label feeding means 9, known per se and only diagrammatically shown, which are borne by frame 8.

[0018] Advantageously, machine 1 also comprises:

- constraint hinge means 10 arranged at the periphery of carousel 2 and connecting labelling station 7 to carousel 2 in an orientable manner about an axis B parallel to axis A (see in particular figure 3); and
- fastening means 11 to fasten labelling station 7 to the ground in a predetermined position with respect to carousel 2.

[0019] As can be seen in figure 2, fastening means 11 are arranged at a predetermined distance other than zero from the periphery of carousel 2. In the example shown, fastening means 11 are arranged in an outer position with respect to carousel 2.

[0020] Furthermore, again in the example shown herein, fastening means 11 are arranged at a rear end portion 12 of labelling station 7 opposite to front end portion 13, adjacent to carousel 2.

[0021] Machine 1 also comprises first resting means 14 of labelling station 7 to a peripheral portion 15 of frame 3 of carousel 2, and second resting means 16 to the ground of labelling station 7, which are arranged at a predetermined distance other than zero from resting means 14.

[0022] In greater detail, frame 8 comprises a boxed body 17 having an approximately prismatic configuration and defined on top by a horizontal plane 18, on which label feeding means 9 are mounted.

[0023] As can be seen in particular in figure 2, boxed body 17 of frame 8 is supported, at front end portion 13, by peripheral portion 15 of frame 3 of carousel 2 through constraint hinge means 10 and resting means 14, and is supported, at rear end portion 12, by the ground through fastening means 11 and resting means 16. Frame 8 is therefore of the self-supporting type.

[0024] With reference to figures 1 to 4, constraint hinge means 10 comprise a pin 20 protruding on the front from end portion 13 of frame 8, and a receiving bush 21 of pin 20, borne by peripheral portion 15 of frame 3 of carousel 2.

[0025] More precisely, pin 20 is borne by a bracket 22 extending towards carousel 2 from end portion 12 of frame 3.

[0026] Preferably, bush 21 defines a receiving seat 23 for pin 20, defined by a rounded concave surface, in the example shown having a substantially spherical configuration (figure 4).

[0027] Pin 20 accordingly has a head 25 having a con-

figuration complementary to that of the surface defining seat 23 of bush 21.

[0028] Thereby, an easy self-alignment between pin 20 and receiving bush 21 can be obtained during assembly.

[0029] With reference to figures 1, 2, 3 and 5, resting means 14 comprise another pin 26 protruding on the front from end portion 13 of frame 8 in a position adjacent to pin 20, and a receiving element 27 borne by peripheral portion 15 of frame 3 of carousel 2 and defining an abutment surface 28 for a lower end 29 of pin 26.

[0030] More precisely, pin 26 is borne by a bracket 30, of the same type of bracket 22 and extending parallel to the latter towards carousel 2 from end portion 13 of frame 8. Lower end 29 of pin 26 preferably has a spherical configuration. Abutment surface 28 of receiving element 27 has a horizontal flat configuration instead.

[0031] With reference to figures 2, 6 and 7, fastening means 11 comprise a leg 31 extending vertically downwards from boxed body 17 of frame 8 at end portion 12, and a resting foot 32 of this leg 31, fastened to the ground by means of several screws or similar locking elements.

[0032] As can be seen in particular in figures 6 and 7, foot 32 has a frustoconical configuration and defines a seat 33 having a rounded configuration for receiving a lower head 34 having a shape complementary to leg 31.

[0033] More precisely, seat 33 is defined by a concave surface 35 having a conical inlet segment 36 and a substantially spherical segment 37 for engaging head 34 of leg 31.

[0034] With reference to figures 2 and 6, resting means 16 comprise another leg 38, which extends vertically downwards from boxed body 17 of frame 8 at end portion 12 and in a position adjacent to leg 31, and rests on the ground by means of a relative foot 40.

[0035] Finally, labelling station 7 is supported on the rear by legs 31 and 38 and by feet 32 and 40, and rests on the front to peripheral portion 15 of frame 3 of carousel 2 by the effect of the cooperation of pins 20, 26 respectively with bush 21 and with receiving element 27.

[0036] From an analysis of the features of machine 1 made according to the present invention, the advantages it allows to obtain are apparent.

[0037] In particular, as shown in figure 3, during assembly of machine 1, it is sufficient to couple labelling station 7 to carousel 2 in a single position defined by the engagement of pin 20 in bush 21, and then rotate labelling station 7 about axis B until the desired position is reached. The fastening of foot 32 of leg 31 to the ground allows to lock the position of labelling station 7 with respect to carousel 2.

[0038] More precisely, in the solution shown, foot 32 is first fastened to the ground in the desired position with respect to carousel 2; subsequently, labelling station 7 is coupled to carousel 2 at axis B of constraint hinge means 10, and labelling station 7 is rotated until head 34 of leg 31 is engaged in seat 33 of foot 32 and lower end 29 of pin 26 rests on abutment surface 28 of receiving

element 27.

[0039] In virtue of the fact that the position of labelling station 7 is determined by the fastening of station 7 to the ground and not to carousel 2, and of the fact that there is only one constraint position between labelling station 7 and carousel 2, coupling tolerances between the above said parts need not be very restrictive, with the consequence that the overall manufacturing costs of the whole machine are limited.

[0040] Finally, it is clear that modifications and variants to machine 1 disclosed and shown herein can be made without departing from the scope of protection defined by the claims.

Claims

1. A labelling machine (1) for applying labels on respective items, in particular containers or the like, comprising:

- at least one carousel (2) rotating about a first vertical axis (A) and peripherally bearing a plurality of said items; and
- at least one labelling station (7) arranged peripherally with respect to said carousel (2) and adapted to feed labels to the carousel (2);

characterised by further comprising:

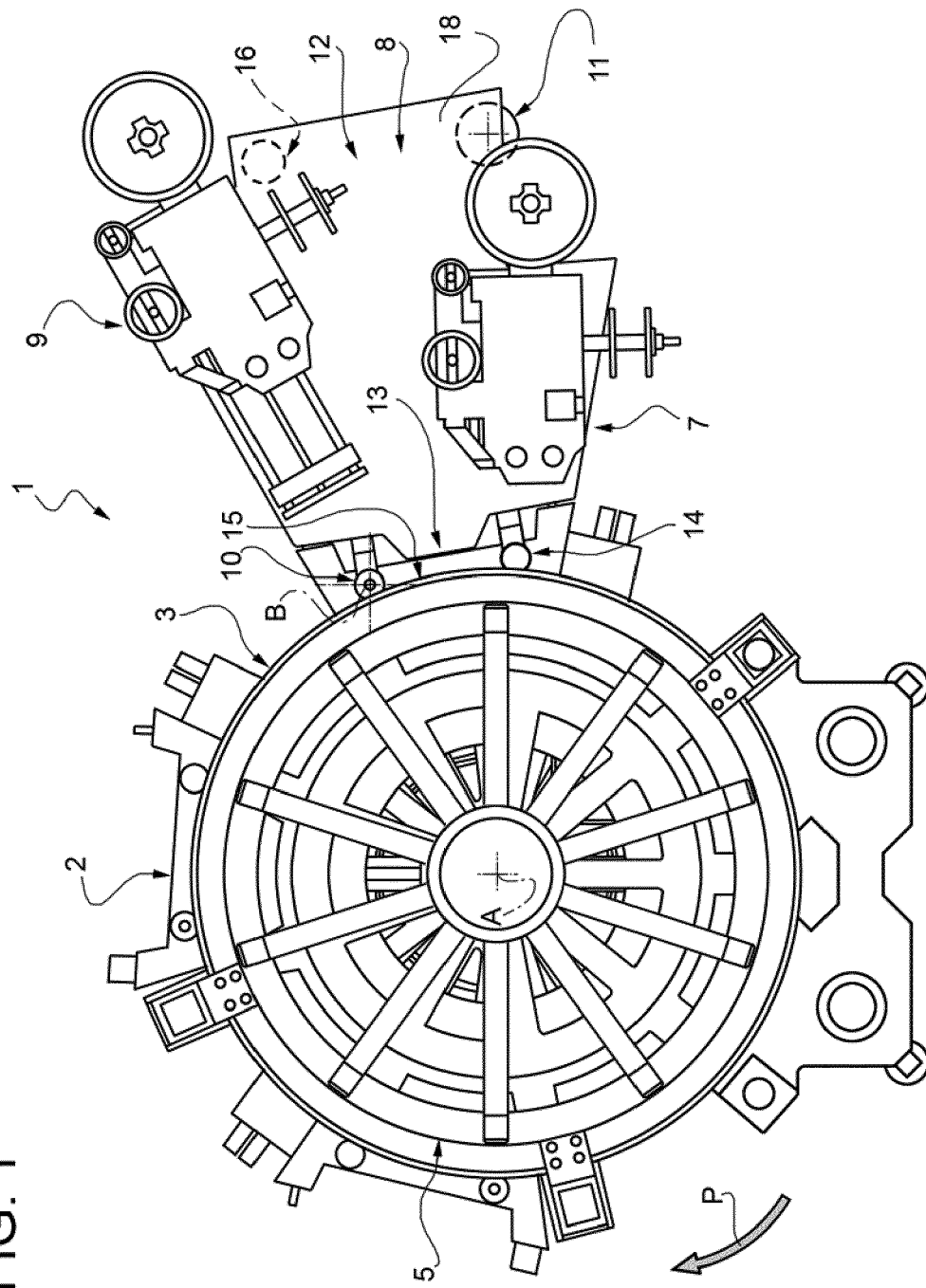
- constraint hinge means (10) arranged at the periphery of said carousel (2) and connecting said labelling station (7) to the carousel (2) in an orientable manner about a second axis (B) parallel to said first axis (A); and
- fastening means (11) of said labelling station (7) to the ground in a predetermined position with respect to said carousel (2), said fastening means (11) being arranged at a predetermined distance other than zero from the periphery of said carousel (2).

2. The machine according to claim 1, wherein said fastening means (11) are arranged in an outer position with respect to said carousel (2).
3. The machine according to claim 1 or 2, also comprising first resting means (14) of said labelling station (7) to a peripheral portion (15) of said carousel (2), and second resting means (16) of said labelling station (7) to the ground, arranged to a predetermined distance other than zero from said resting means (14).
4. The machine according to any of the preceding claims, wherein said carousel (2) comprises a first fixed support frame (3) and an operative unit (5) mounted on said first frame (3) in a rotatable manner

about said first axis (A) and bearing said items, and wherein said labelling station (7) comprises a second support frame (8) and feeding means (9) of said labels, borne by said second frame (8).

5. The machine according to claim 4, wherein said constraint hinge means (10) and said first resting means (14) are arranged at a first end portion (13) of said second frame (8), and wherein said fastening means (11) and said second resting means (16) are arranged at a second end portion (12) of said second frame (8).
6. The machine according to claim 4 or 5, wherein said constraint hinge means (10) comprise a pin (20) borne by one (8) of said first and second frames (3, 8), and a receiving seat (23) of said pin (20), borne by another (3) of said first and second frame (3, 8).
7. The machine according to claim 6, wherein said seat (23) of said constraint hinge means (10) is defined by a surface having a rounded configuration and said pin (20) has a head (25) having a configuration complementary to that of said seat (23) and is engaged in the seat (23).
8. The machine according to claim 6 or 7, wherein said seat (23) of said constraint hinge means (10) is borne by said first frame (3) and said pin (20) is borne by said second frame (8).
9. The machine according to any of claims 4 to 8, wherein said fastening means (11) comprise a leg (31) of said second frame (8) and a resting foot (32) of said leg (31), fixed to the ground.
10. The machine according to claim 9, wherein said foot (32) defines a receiving seat (33) for a head (34) having a configuration complementary to said leg (31).
11. The machine according to any of claims 4 to 10, wherein said first resting means (14) comprise a resting element (26) borne by said second frame (8) and cooperating in abutment on a receiving element (27) of said first frame (3).
12. The machine according to claim 11, wherein said receiving element (27) has a flat horizontal surface (28) and said resting element (26) has a head (29) defined by a surface having a rounded configuration and cooperating in abutment with said horizontal surface (28).
13. The machine according to any of claims 4 to 12, wherein said second resting means (16) comprise another leg (38) of said second frame (8) rested on the ground.

FIG. 1



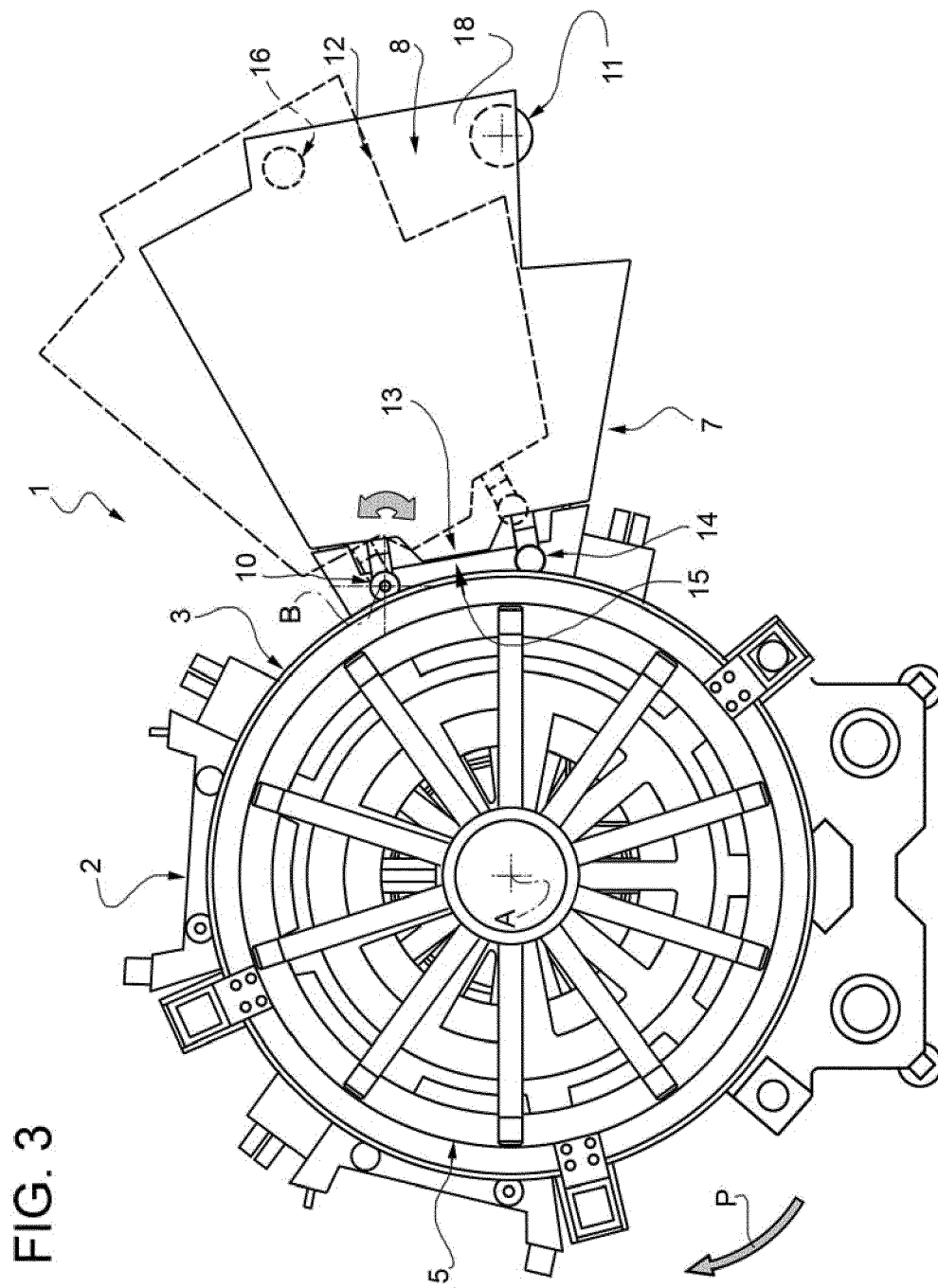


FIG. 4

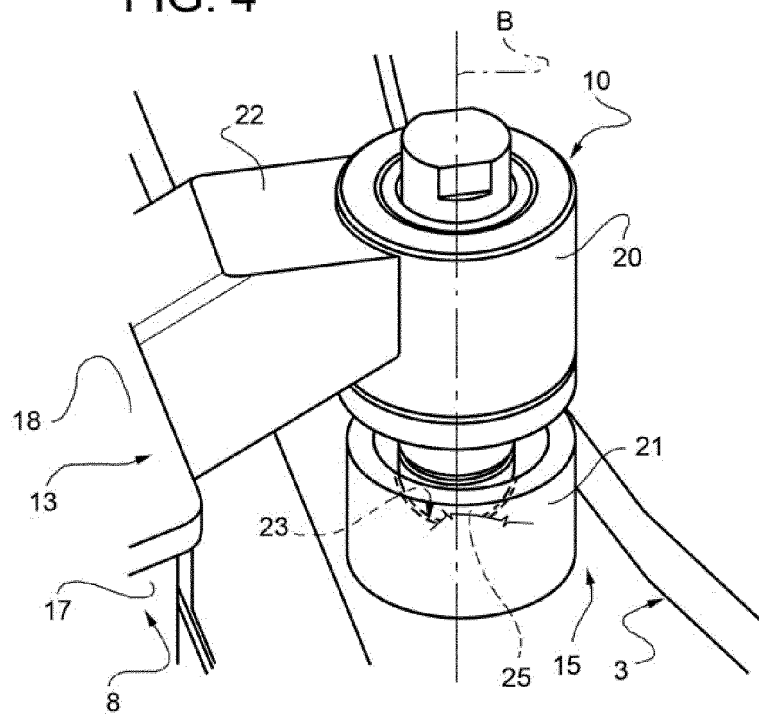


FIG. 5

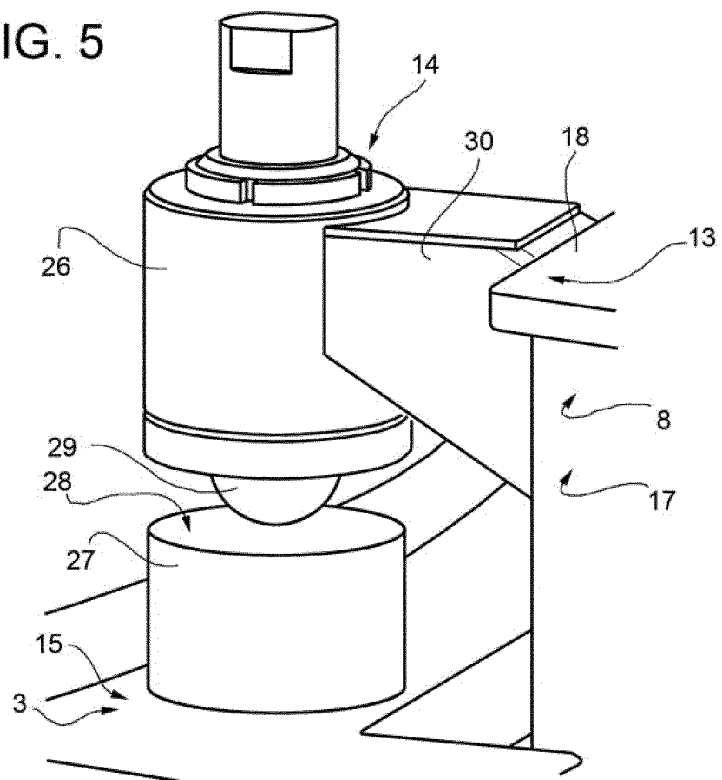


FIG. 6

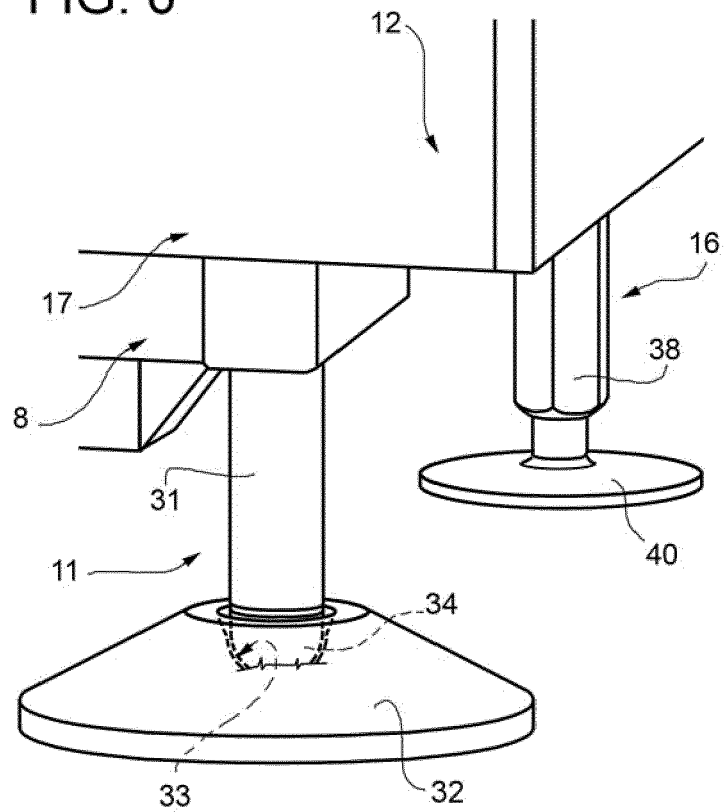
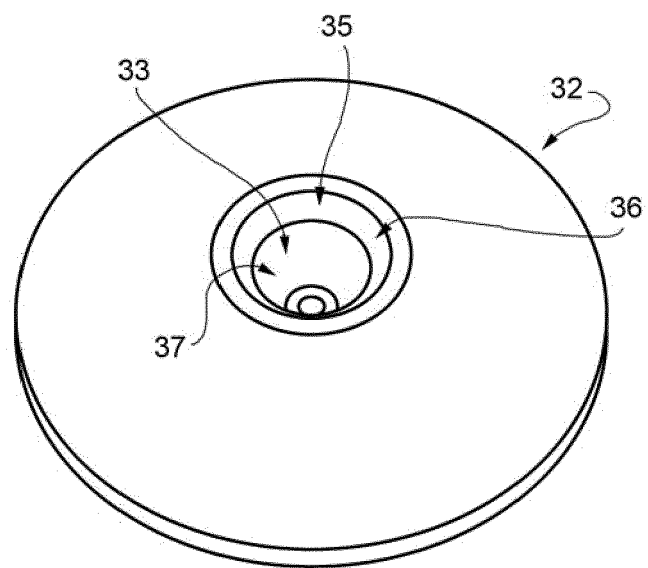


FIG. 7





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Application Number
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 5 March 2013	Examiner Wartenhorst, Frank
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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