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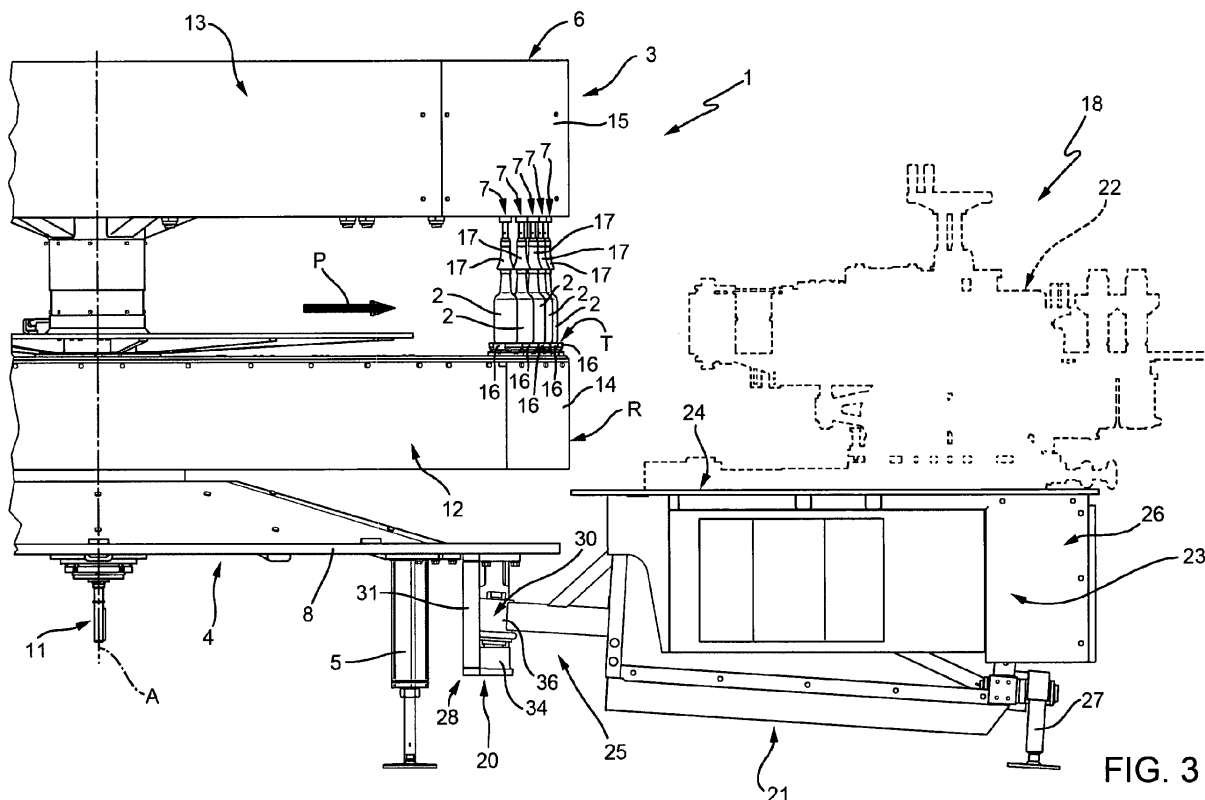
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(54) **Labelling machine**

(57) A labelling machine (1) for applying labels to respective articles (2), in particular bottles, containers or similar, and which has a carousel (3) rotating about a vertical axis of rotation (A) and peripherally supporting a number of articles (2); at least one labelling station (18)

located at the periphery of, and for feeding labels to, the carousel (3); and connecting means (20) releasably connecting the labelling station (18) to the carousel (3); the connecting means (20) being located inwards of the carousel (3), at a predetermined distance of other than zero from the perimeter (R) of the carousel (3).



Description

[0001] The present invention relates to a labelling machine for labelling articles, in particular containers, bottles or similar, to which the following description refers purely by way of example.

[0002] More specifically, the present invention relates to a labelling machine for labelling containers conveyed along a predetermined path on a liquid or powdered product bottling system.

[0003] As is known, the major parts of labelling machines (carousel, conveying devices, labelling stations for feeding labels to the carousel, etc.) are normally all located on a table structure forming the support of the machine. This type of construction is bulky and makes maintenance and cleaning difficult by limiting access to the individual units.

[0004] One proposal to partly eliminate these drawbacks, e.g. as described in German Patent n. DE-A-3134661, is to use a small table structure supporting :

- a centre carousel;
- an input starwheel for loading the unlabelled containers onto the carousel;
- an output starwheel for unloading the labelled containers off the carousel; and
- a labelling station for feeding labels to the carousel.

[0005] Despite being made smaller, the table structure is still fairly bulky and expensive, and the solution proposed is fairly rigid in terms of reconfiguring the machine, as normally required in this particular sector, e.g. to adapt to different production requirements, changes in the size and/or shape of the containers, etc. Another important point to bear in mind is that major alterations to the overall configuration of labelling machines often cost more than changing the whole machine.

[0006] To solve these problems, EP-B-1412279 proposes a self-supporting labelling station - i.e. with its own supporting structure resting on the floor - fixed to the periphery of the carousel. More specifically, it proposes fixing the position of the labelling station in relation to the carousel simply by means of a number of connectors at the periphery of the carousel.

[0007] This allows easier access to machine parts, is more compact than the one-table-structure solution supporting all the major machine units, and is fairly flexible in terms of reconfiguring the machine as a whole.

[0008] On the other hand, connecting the labelling station to the periphery of the carousel can pose problems when working with glass containers. That is, breakage of the containers results in glass shards fouling the work area and possibly becoming lodged in the highly exposed area between the carousel and the labelling station, which eventually become misaligned, thus resulting in improper labelling of the containers and abnormal stress on the moving parts.

[0009] Even when working with other than glass con-

tainers, residue such as label particles or liquid may easily lodge in the area between the carousel and the labelling station, thus creating the same problems. In this connection, beer residue, in particular, may eventually pose serious problems when disconnecting and reconnecting the two parts.

[0010] It is an object of the present invention to provide a labelling machine for labelling articles, in particular containers or similar, designed to provide a cheap, simple solution to the above drawbacks of known labelling machines, and which at the same time is highly flexible, cheap to produce, easy to assemble, and fully accessible.

[0011] According to the present invention, there is provided a labelling machine as claimed in Claim 1.

[0012] A preferred, non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a view in perspective, with parts removed for clarity, of a labelling machine in accordance with the teachings of the present invention; Figure 2 shows an underside view, with parts removed for clarity, of the Figure 1 labelling machine; Figure 3 shows a side view, with parts removed for clarity, of the Figure 1 and 2 labelling machine; Figure 4 shows a larger-scale view in perspective of assembly of a carousel and labelling station of the labelling machine according to the present invention; Figure 5 shows a larger-scale view in perspective of a detail of the carousel-labelling station connection; Figure 6 shows a larger-scale view in perspective of the labelling station of the labelling machine according to the present invention.

[0013] Number 1 in Figures 1-4 indicates as a whole a labelling machine for applying known labels (not shown) to respective articles 2, in particular bottles (as in the example shown), containers or similar.

[0014] Machine 1 substantially comprises a carousel 3 for receiving unlabelled articles 2 from respective known input conveying means (not shown); feeding them along a path P substantially in the form of an arc of a circle with a vertical axis A; and transferring the labelled articles to respective known output conveying means (not shown).

[0015] The input and output conveying means are typically defined by respective starwheels.

[0016] Carousel 3 is coaxial with axis A and comprises a fixed supporting frame 4 resting on the floor on a number of legs 5; and a rotary assembly 6 mounted on frame 4 to rotate about axis A, and having a number of peripheral operating units 7 for receiving respective unlabelled articles 2.

[0017] Frame 4 substantially comprises a peripheral portion 8 substantially in the form of an annular plate and supported on legs 5; and a central portion 9 radially inwards of peripheral portion 8, connected to peripheral

portion 8 by a number of substantially radial arms 10, and supporting a rotary shaft 11, of axis A, for rotating rotary assembly 6.

[0018] As shown in Figures 1, 3 and 4, rotary assembly 6 substantially comprises a bottom supporting structure 12 and top supporting structure 13, which are bounded peripherally by respective cylindrical walls 14, 15 of axis A, are fixed to shaft 11 in positions spaced apart along axis A, and define operating units 7.

[0019] More specifically, bottom supporting structure 12 has a number of peripheral seats 16 equally spaced about axis A to receive the bottom portions of respective articles 2, and which thus define, over frame 4, a horizontal transportation surface T for transporting articles 2 (Figures 3 and 4).

[0020] Similarly, top supporting structure 13 has a number of peripheral retainers 17 equally spaced about axis A, and which cooperate with the top portions of respective articles 2.

[0021] Each seat 16 cooperates with a corresponding retainer 17 to keep article 2 in a stable position as it is conveyed along path P by rotary assembly 6; and each seat 16 and corresponding retainer 17 thus define an operating unit 7.

[0022] As shown particularly in Figure 3, top and bottom supporting structures 13, 12 project radially outwards of frame 4.

[0023] Machine 1 also comprises a labelling station 18 located at the periphery of carousel 3 to feed carousel 3 with labels to apply to respective articles 2.

[0024] Labelling station 18 is connected to carousel 3 by releasable connecting means 20.

[0025] More specifically, labelling station 18 comprises a supporting frame 21; and known label feed means 22 (only shown schematically) fitted to frame 21.

[0026] More specifically, frame 21 comprises a roughly prismatic box body 23 bounded at the top by a horizontal surface 24 fitted with feed means 22.

[0027] The front end portion 25 of box body 23 of frame 21 is fitted to frame 4 of carousel 3 by connecting means 20, and its rear end portion 26 rests on the floor on two legs 27, i.e. frame 21 is not self-supporting.

[0028] Connecting means 20 are advantageously located inwards of carousel 3, at a predetermined distance of other than zero from the perimeter R (Figure 2) of carousel 3.

[0029] More specifically, connecting means 20 are located inwards of frame 4 of carousel 3, below transportation surface T of articles 2, and preferably radially inwards of operating units 7 with respect to axis A.

[0030] More specifically, connecting means 20 are located on peripheral portion 8 of frame 4, at a predetermined distance, of other than zero, inwards of the perimeter of peripheral portion 8.

[0031] Connecting means 20 comprise a first interface 28 fixed to and projecting from the underside of peripheral portion 8 of frame 4 of carousel 3, and located radially inwards of the perimeter of frame 4 with respect to axis

A; and a second interface 30 fitted to front end portion 25 of box body 23 of labelling station 18 and connectable releasably to interface 28.

[0032] As shown in Figures 1-5, interface 28 comprises a hitch 31, which projects downwards from peripheral portion 8 of frame 4, is located a predetermined radial distance of other than zero from the perimeter of peripheral portion 8, and has, close to its opposite lateral portions, respective recesses 32, 33 housing respective bushings 34, 35 with axes parallel to axis A.

[0033] As shown in Figures 1, 2, 3, 4 and 6, interface 30 comprises two identical pins 36, 37 projecting frontwards towards carousel 3 from front end portion 25 of box body 23 of labelling station 18, and designed to engage respective bushings 34, 35.

[0034] More specifically (Figures 4, 6), pins 36, 37 have respective substantially hemispherical bottom end portions 38.

[0035] Bushing 34 defines a seat 40 for receiving pin 36 and bounded by a substantially hemispherical concave surface complementary with bottom end portion 38 of pin 36, i.e. seat 40 defines a closed area for receiving pin 36.

[0036] Bushing 35 is similar to bushing 34, but has a seat 41 for receiving pin 37, and which is open both on the side facing bushing 34 and on the opposite side, to allow engagement by pin 37 with a certain amount of horizontal tolerance perpendicular to axis A.

[0037] As shown particularly in Figures 4 and 6, both pins 36, 37 are fitted idly with respective rings 42 for guiding insertion of pins 36, 37 inside respective recesses 32, 33 on hitch 31.

[0038] In other words, labelling station 18 is supported at the rear on legs 27, and rests, at the front, on hitch 31 of interface 28, by pins 36, 37 cooperating with respective bushings 34, 35.

[0039] The advantages of machine 1 according to the teachings of the present invention will be clear from the above description.

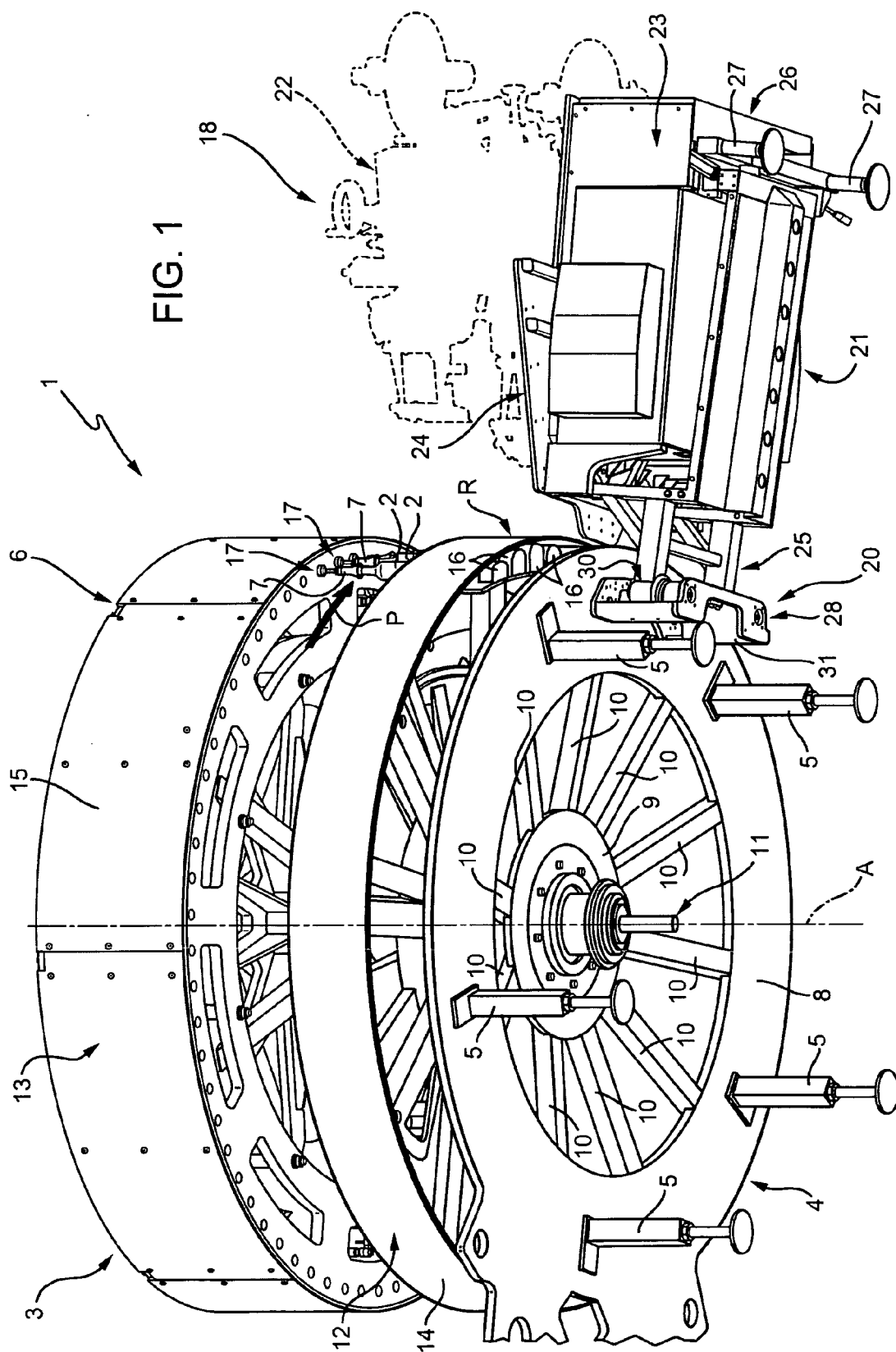
[0040] In particular, by locating connecting means 20 below the transportation surface of articles 2 and inwards of frame 4 of carousel 3, the connection between labelling station 18 and carousel 3 is safely protected against residue or glass shards - when working with glass bottles obviously subject to breakage - which are highly unlikely to become lodged between interfaces 28 and 30.

[0041] The solution described also allows labelling station 18 to be positioned easily and to be assembled and disassembled easily to and from carousel 3, i.e. better protection of the connection between carousel 3 and labelling station 18 is achieved without impairing easy connection and disconnection of the two parts.

[0042] Clearly, changes may be made to machine 1 as described and illustrated herein without, however, departing from the protective scope of the accompanying Claims.

Claims

1. A labelling machine (1) for applying labels to respective articles (2), in particular bottles, containers or similar, and comprising :
 - at least one carousel (3) rotating about a vertical axis of rotation (A) and peripherally supporting a number of said articles (2);
 - at least one labelling station (18) located at the periphery of, and for feeding labels to, said carousel (3); and
 - connecting means (20) releasably connecting said labelling station (18) to said carousel (3); the machine being **characterized in that** said connecting means (20) are located inwards of said carousel (3), at a predetermined distance of other than zero from the perimeter (R) of the carousel (3).
2. A machine as claimed in Claim 1, wherein said carousel (3) defines a horizontal transportation surface (T) for transporting said articles (2); and said connecting means (20) are located below said surface (T).
3. A machine as claimed in Claim 1 or 2, wherein said carousel (3) comprises a fixed supporting frame (4); and a rotary assembly (6) fitted to said frame (4) to rotate about said axis (A), and having a number of peripheral operating units (7) for receiving respective unlabelled articles (2); and wherein said connecting means (20) are located inwards of said frame (4).
4. A machine as claimed in Claim 3, wherein said connecting means (20) are located radially inwards of said operating units (7) with respect to said axis (A).
5. A machine as claimed in Claim 3 or 4, wherein said frame (4) comprises a peripheral portion (8); and a central portion (9) radially inwards of said peripheral portion (8) with respect to said axis (A), connected to the peripheral portion (8) by a number of arms (10), and supporting said rotary assembly (6) in rotary manner; and said connecting means (20) are located on said peripheral portion (8) of said frame (4), at a predetermined distance, of other than zero, inwards of the perimeter of the peripheral portion (8).
6. A machine as claimed in any one of Claims 3 to 5, wherein said connecting means (20) comprise a first interface (28) fixed to said frame (4) of said carousel (3) and radially inwards of the perimeter (R) of the carousel (3); and a second interface (30) fitted to the front of said labelling station (18) and connectable releasably to said first interface (28).
7. A machine as claimed in Claim 6, wherein said second interface (30) comprises at least two pins (36, 37) parallel to said axis (A); and said first interface (28) comprises at least two seats (34, 35) for receiving said pins (36, 37).
8. A machine as claimed in Claim 7, wherein one (34) of said seats (34, 35) defines a closed area for receiving the relative pin (36); and the other said seat (35) is open on opposite sides in a horizontal direction crosswise to said axis (A), so as to be engaged by the relative pin (37) with a certain amount of tolerance in said direction.
9. A machine as claimed in Claim 8, wherein said seats (34, 35) are formed on a hitch (31) fixed inwards of said frame (4) of said carousel (3).
10. A machine as claimed in any one of the foregoing Claims, wherein said labelling station (18) is supported at the front by said carousel (3), by means of said connecting means (20), and at the rear by at least two legs (27) resting on the floor.



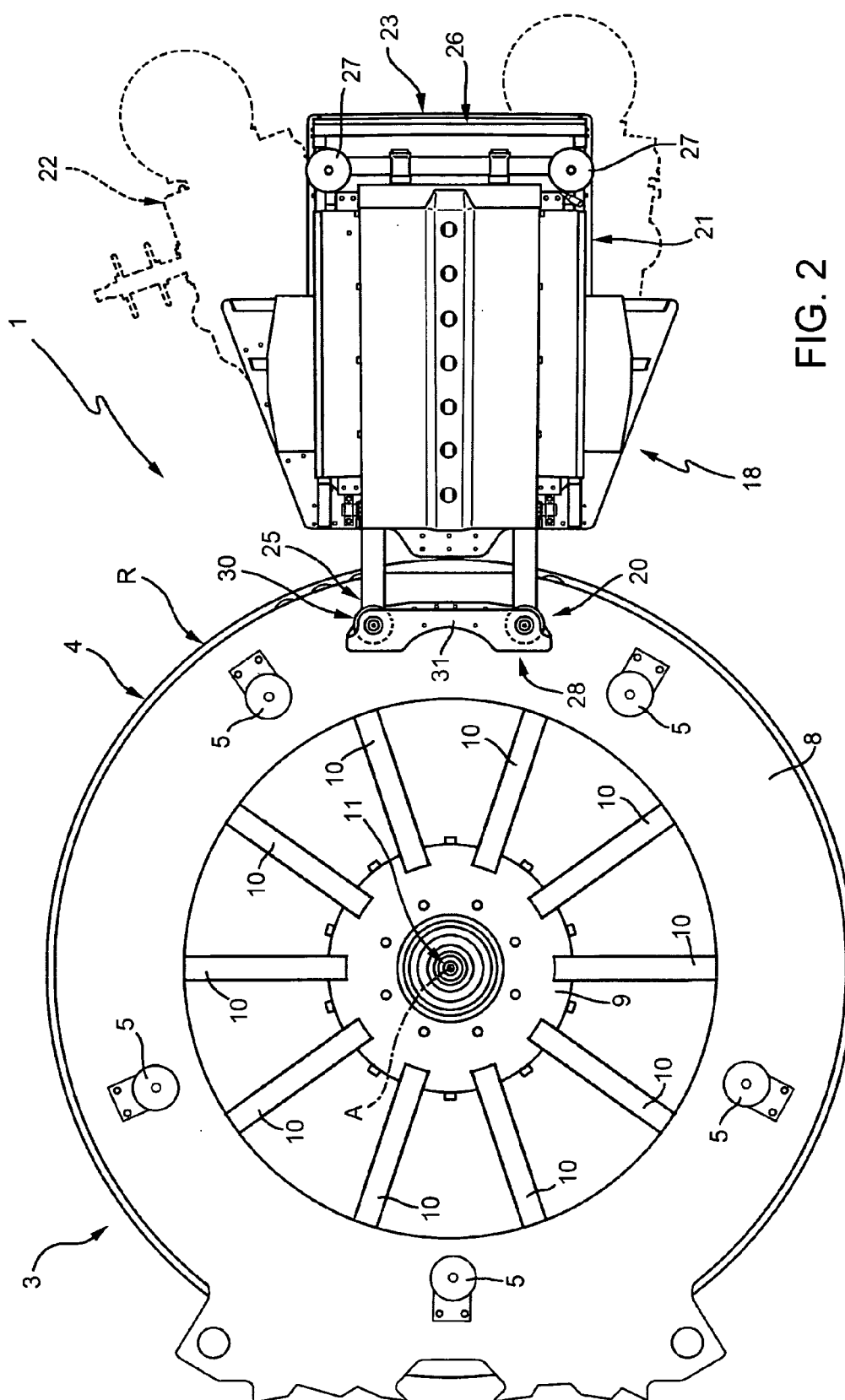


FIG. 2

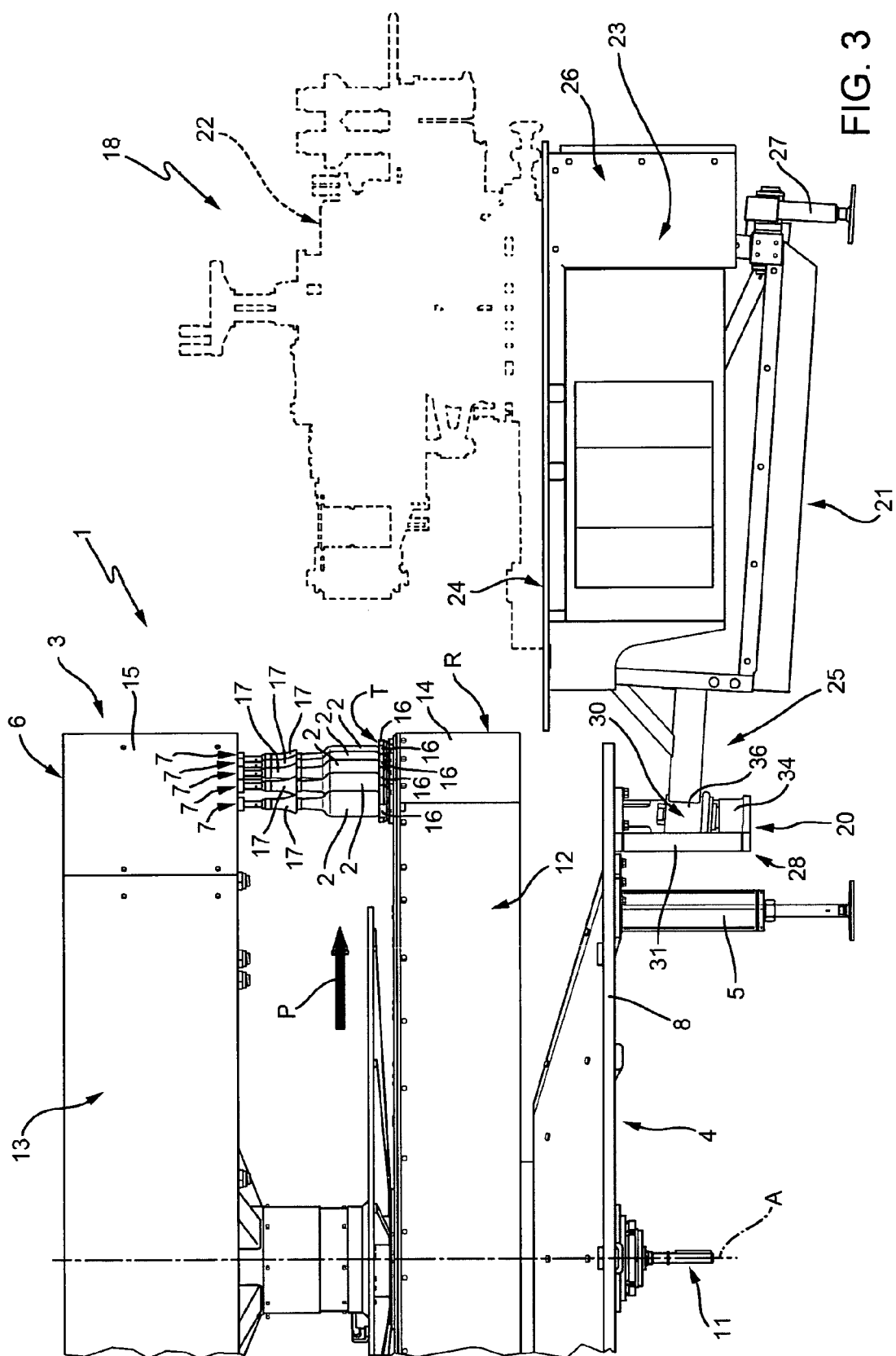
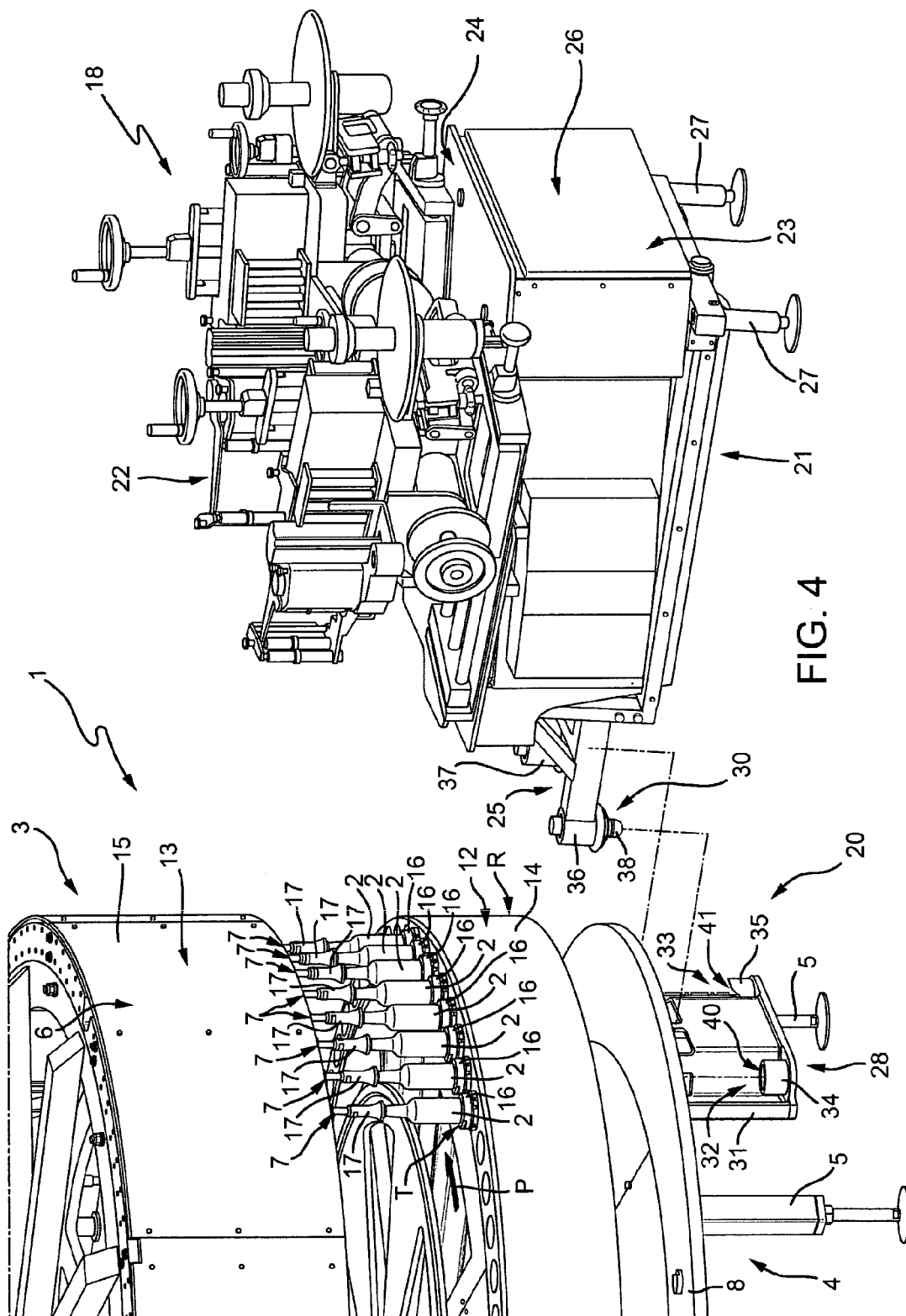
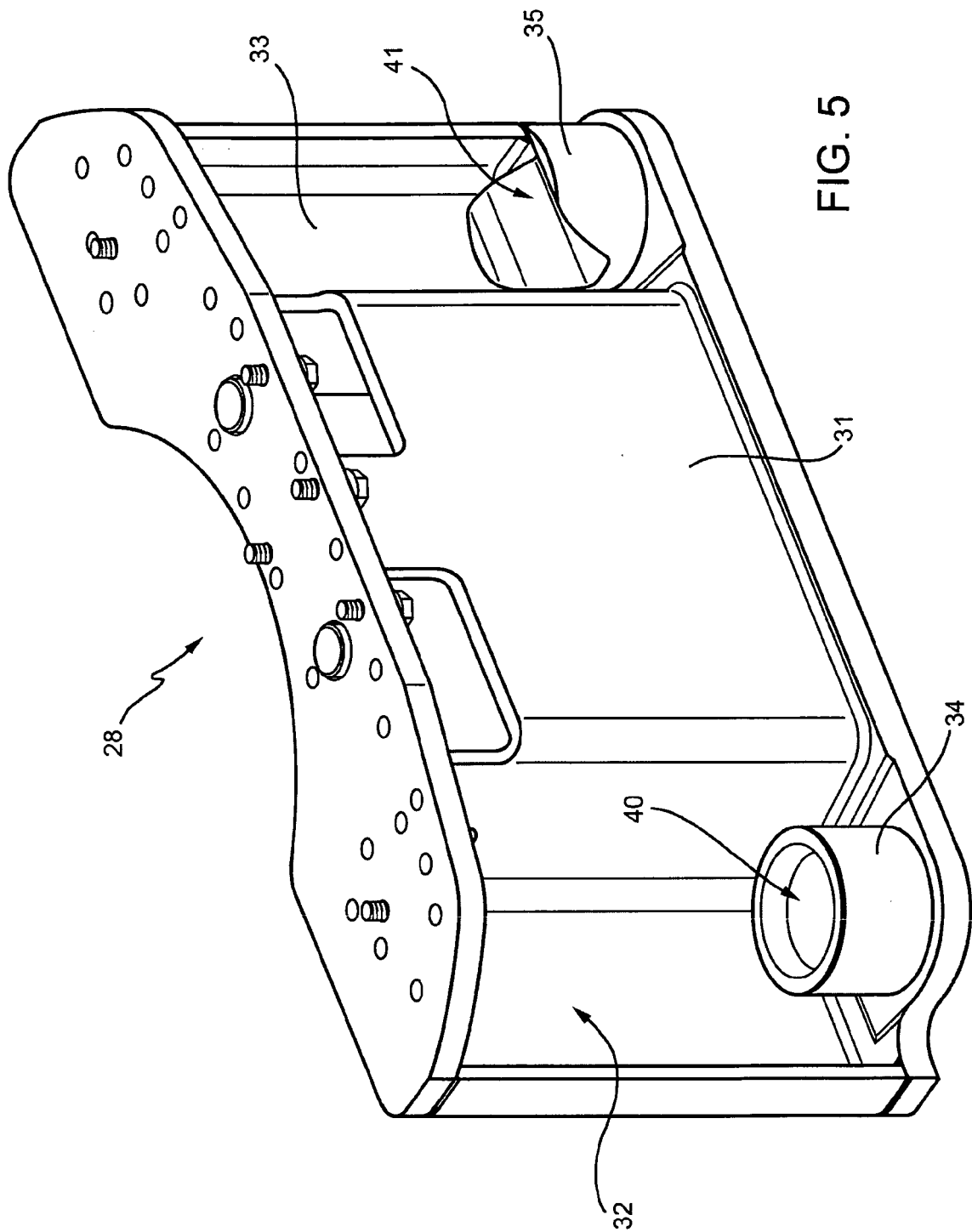


FIG. 3





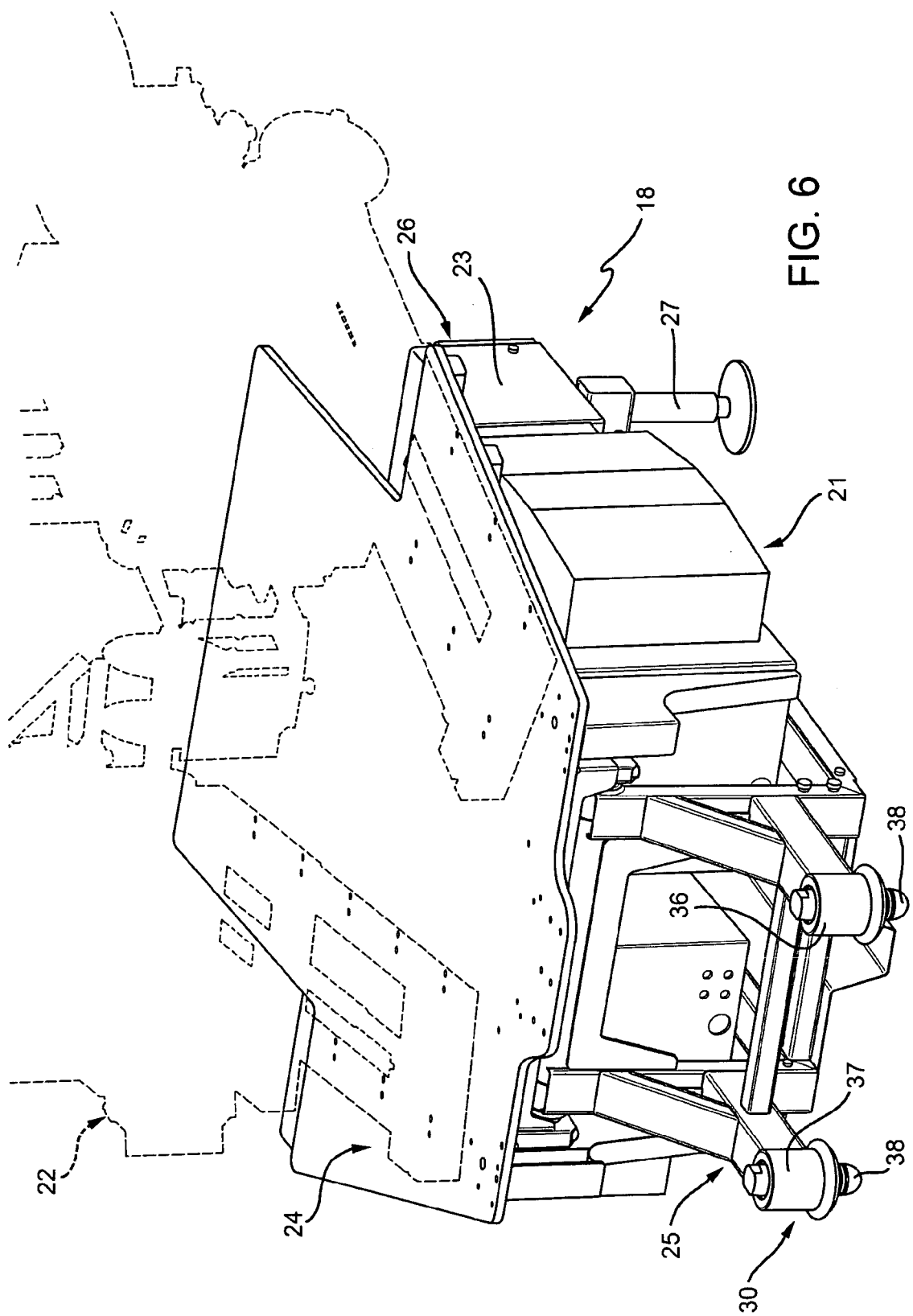


FIG. 6



EUROPEAN SEARCH REPORT

Application Number
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Place of search The Hague		Date of completion of the search 14 January 2013	Examiner Luepke, Erik
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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