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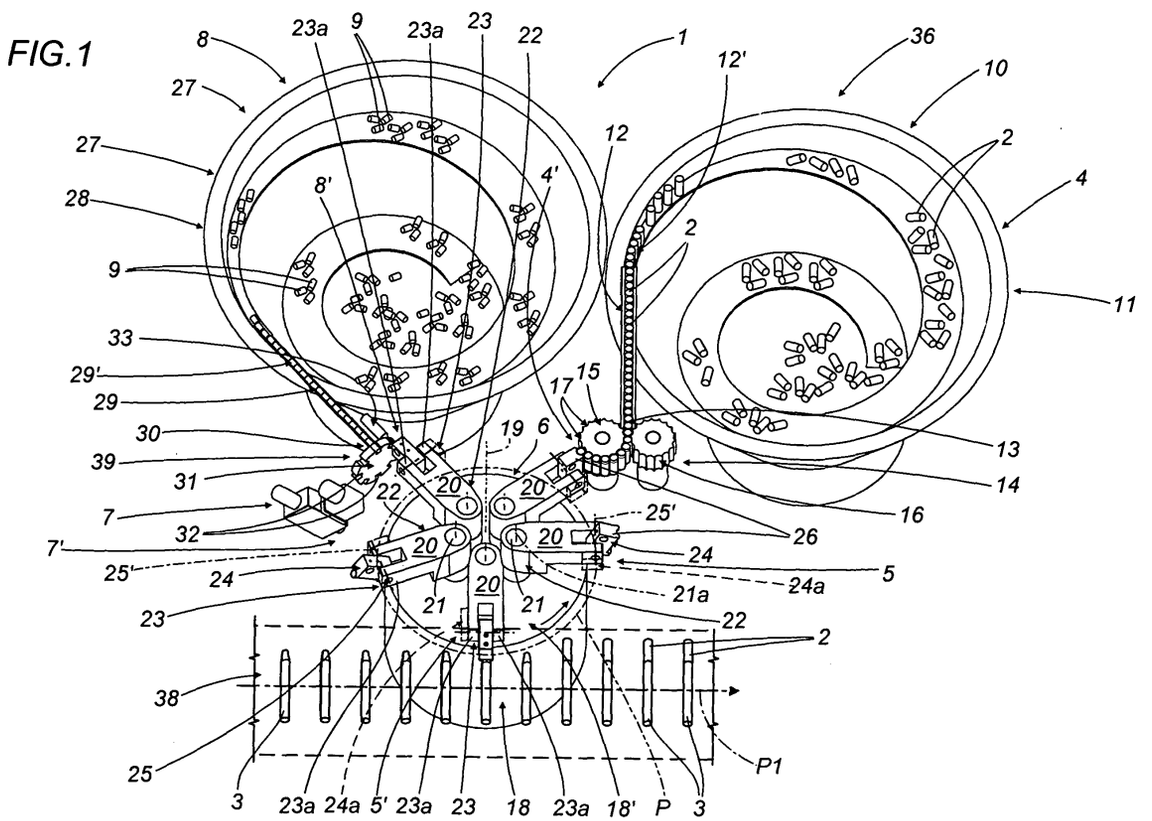
(54) A unit for attaching mouthpieces to cigars

(57) Mouthpieces (2) are attached to cigars (3) by a unit (1) comprising a transfer device (5) located along a set feed path (P) and incorporating a conveyor device (6) by which the mouthpieces (2) are advanced between a distributing station (4'), where they are dispensed, and a station (5') where each one is attached to a respective cigar (3); also located along the path (P) are a station (8') supplying filter plugs (9), at which one such plug is inserted into each mouthpiece (2), and a gumming station (7') at which one end of the mouthpiece (2) is tacked with adhesive to ensure a firm bond with the corresponding end of the cigar (3).

FIG.1



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Description

[0001] The present invention relates to a unit for attaching mouthpieces to cigars.

[0002] In particular, the present invention relates to a unit by which mouthpieces, with or without filters, are attached to cigars during the course of their manufacture.

[0003] At present, the attachment of such mouthpieces to cigars is substantially a manual operation.

[0004] The step of attaching mouthpieces by hand during the course of a cigar-making process carried out on an automated line has the effect of reducing the productivity and disrupting the continuity of the cigar-making machine, and generating high costs.

[0005] The object of the present invention is to provide a unit for attaching mouthpieces to cigars, such as will be unaffected by the aforementioned drawbacks.

[0006] The stated object is realized in a unit according to the invention for the attachment of mouthpieces to cigars advancing along a first predetermined path, characterized in that it comprises a device for transferring and attaching the mouthpieces, positioned along a second predetermined path and comprising in its turn a conveyor device by which the mouthpieces are advanced at least between a distributing station and a station at which the mouthpieces are attached to respective cigars.

[0007] The invention will now be described in detail, by way of example, with the aid of the accompanying drawings, in which:

- figure 1 illustrates a unit according to the present invention for attaching mouthpieces, viewed schematically and in perspective;
- figure 2 illustrates a different embodiment of the unit in figure 1, viewed schematically and in plan;
- figure 3 is an enlarged detail of figure 1, viewed schematically and in perspective.

[0008] Referring to figures 1 and 2 of the accompanying drawings, 1 denotes a unit, in its entirety, for attaching mouthpieces 2 to cigars 3.

[0009] In the example illustrated, the unit 1 comprises a distributor device 4 installed at a distributing station 4' and dispensing mouthpieces 2, also a device 5 by which the mouthpieces 2 are transferred and attached to cigars 3 advancing along a first predetermined path P1.

[0010] The transfer and attachment device 5 comprises a conveyor device 6 by which the mouthpieces 2 are carried along a second predetermined path P between the aforementioned distributing station 4' and an attachment station 5' at which the mouthpieces 2 are united with the respective cigars 3.

[0011] Also positioned along the second path P are a gumming device 7, installed at a gumming station 7' where a layer of adhesive is applied to one end of each mouthpiece 2 in readiness for connection to a corresponding cigar 2, and a distributor device 8 dispensing filter plugs 9, installed at a further distributing station 8'.

[0012] In the particular example of the drawings, the unit 1 is designed, as will be made clear in due course, to allow the insertion of a filter plug 9 into each mouthpiece 2 at the relative station 8', before the steps of gumming and then attaching the mouthpiece 2 to the corresponding cigar 3.

[0013] In other embodiments, not illustrated, the unit 1 might not include the device 8 for distributing filter plugs 9, in which case the mouthpiece 2 attached to each cigar 3 will be filterless.

[0014] Referring to figure 1, the distributor device 4 comprises a vibrating container 10, familiar in embodiment and therefore not described further, forming part of a singulator device 11 by which mouthpieces 2 arranged typically at random inside the container 10 are ordered into single file.

[0015] The mouthpieces 2 are directed by the vibrating container 10 to the inlet of a channel 12 along which they are conveyed toward an outlet 13 of the selfsame channel 12 in an ordered succession 12', one behind another and presenting a predetermined attitude, that is to say all arranged and oriented in identical manner, and in particular with axes vertically disposed.

[0016] In other possible solutions not illustrated, the container 10 might be replaced by any other type of singulator device 11, for example centrifugal or rotary with fixed guide elements, substantially of conventional embodiment.

[0017] Also forming part of the distributor device 4 are take-up means 14 operating at the outlet 13 of the channel 12, comprising a pair of fluted rollers 15 and 16 substantially tangential one to the other, set in rotation about vertical axes respectively clockwise and anticlockwise, as viewed in figure 1, and operating in concert.

[0018] In particular, the first roller 15 presents a plurality of aspirating grooves 17 connected to a source of negative pressure not illustrated in the drawings, by which the mouthpieces 2 are taken up at the outlet 13 of the channel 12 and retained.

[0019] The second roller 16, which is not connected to any source of suction, serves to ensure that the mouthpieces 2 locate correctly in the grooves 17 of the first roller 15.

[0020] The aforementioned conveyor device 6 comprises a substantially cylindrical turntable 18 caused to rotate about a vertical axis 19, anticlockwise as viewed in figures 1 and 2, through the agency of conventional drive means neither illustrated nor described further.

[0021] The top surface 18' of the table 18 carries a set of substantially radial arms 20, numbering five in the example illustrated, angularly equispaced and anchored each by one end 22 to a relative pivot 21 of which the axis 21a is disposed parallel to the vertical axis 19 aforementioned; the arms 20 can be made to swing on the pivots 21 by actuator means not illustrated in the drawings, in a manner that will become clear in due course.

[0022] The free end of each arm 20 projects beyond the periphery of the top surface 18' and consists in a clevis 23 of which the two members 23a are disposed substantially horizontal, occupying a common plane, and interconnected by a pin 25 (figures 1 and 3) disposed orthogonally to the axis 19 of the table.

[0023] Each pin 25 carries an element 24 appearing as a finger of substantially parallelepiped geometry and serving to retain a mouthpiece 2. Also associated with each arm 20 are actuator means illustrated schematically in phantom lines as a block 24a, by which the relative pin 25 and retaining element 24 can be caused to rotate as one about the relative axis 25'. One outwardly directed face 24b of the element 24 affords a groove 26 contoured, as shown in figure 3, in such a manner as to accommodate a single mouthpiece 2 and retain it by suction during the course of its passage along the second path P.

[0024] When the table 18 is set in rotation about the relative axis 19, each arm 20 is directed along the second path P and the relative retaining element 24 caused to pivot about the aforementioned axis 25' between a position assumed at the distributing station 4', in which the groove 26 is disposed vertically and directed toward a groove 17 of the first roller 15, allowing a mouthpiece 2 to be taken up, and a position assumed at the attachment station 5' with the groove 26 disposed horizontally and occupying substantially the same plane as a feed conveyor 38 by which the cigars 3 are directed along the first path P1.

[0025] With reference in particular to figure 1, the device 8 distributing the filter plugs 9, which is positioned downstream of the device 4 distributing the mouthpieces 2, relative to the second path P, comprises a vibrating container 27 operating in identical fashion to the vibrating container 10 distributing the mouthpieces 2. Likewise in this instance, the container 27 might be substituted by any other singulator of conventional type.

[0026] The vibrating container 27 performs the function of a singulator device 28 by which filter plugs 9 are manoeuvred into an ordered succession 29 and directed along a channel 29', disposed horizontally one behind another, toward an outlet denoted 30.

[0027] The unit 1 also comprises a disc 31 rotatable about an axis 31' parallel to the axis of the channel 29', constituting means 39 by which the plugs 9 are taken up at the outlet 30.

[0028] The periphery of the disc 31 presents a plurality of radial slots 32 each designed to accommodate a respective filter plug 9 and convey it through a predetermined angle into axial alignment with a mouthpiece 2 held by the groove 26 of a retaining element 24. It will be seen that the mouthpiece 2 is disposed horizontally on reaching the station 8' distributing the filter plugs 9, as a result of the retaining element 24 rocking on the axis 25' of the pin 25. In this situation, each successive plug 9 is positioned in alignment with pushing means 33 by which it will be displaced from the slot 32 of the disc 31 and inserted into a respective mouthpiece 2 facing the disc 31.

[0029] As illustrated in figure 2, the device 8 by which the filter plugs 9 are distributed could equally well be replaced by a cutter device 34 of familiar type, in receipt of a continuous filter rod 35 on the inlet side and supplying plugs 9 in an ordered succession 29 to the disc 31 on the outlet side.

[0030] In accordance with the description thus far, the vibrating container 10 of the distributor device 4 and the take-up means 14 combine to create means 36 by which mouthpieces 2 are supplied to the transfer and attachment device 5, and in like manner, the container 27 or cutter device 34 and the disc 31 combine to create means 37 of supplying the filter plugs 9.

[0031] It will be observed that the gumming device 7 is located along the second path P, interposed between the mouthpiece distributing station 4' and the attachment station 5'. More exactly, the gumming device 7 applies a layer of adhesive to the end of the mouthpiece 2 destined for attachment to the cigar 3, in order to ensure it will remain fixed to the cigar 3.

[0032] In operation, mouthpieces 2 are directed from the vibrating container 10 in an ordered succession 12' to the outlet 13 of the channel 12, and taken up by the first roller 15, operating in combination with the second roller 16; thus, each mouthpiece 2 will be retained by suction in a respective groove 17 of the first roller.

[0033] Each successive mouthpiece 2 is attracted by a retaining element 24 of the transfer and attachment device 5 and retained by suction in a substantially vertical position. The device 5 in turn is set in motion by the conveyor device 6 along the second path P as the table 18 rotates on its axis 19.

[0034] Passing along the part of the path P extending between the stations 4' and 8' distributing the mouthpieces 2 and the filters 9, respectively, the retaining element 24 will be caused by the actuator means 24a to pivot together with the mouthpiece 2 on the relative axis 25', ultimately assuming a substantially horizontal position.

[0035] On entering the latter station 8', the disc 31 will rotate on its axis 31' in such a way that a slot 32 is brought into axial alignment with the corresponding mouthpiece 2 held in the groove 26 of the retaining element 24, allowing the transfer of a filter plug 9. Thereupon, the pushing means 33 will be activated to transfer the plug 9 into the mouthpiece 2. In the embodiment of figure 1, the plugs 9 are advanced in the aforementioned ordered succession 29 from the vibrating container 27, whereas in the embodiment of figure 2 the plugs 9 are separated by the cutter device 34 from the continuous filter rod 35.

[0036] Moving along the second path P, the mouthpiece 2 with the inserted plug 9 draws into alignment with the gumming device 7, which as already intimated will apply a layer of adhesive to a given portion of the mouthpiece 2 destined for attachment to a relative cigar

3.

[0037] During this step, in particular, the retaining element 24 will pivot further about the axis 25' so as to angle the mouthpiece 2 at 45° or thereabouts and enable it to receive the adhesive more easily.

[0038] Thereafter, the mouthpiece 2 is returned to the horizontal position and advanced along the second path P until placed in alignment with the transfer and attachment station 5', where the mouthpiece 2 and the cigar 3 are united by inducing a relative movement of the two components.

[0039] More exactly, the mouthpieces 6 are advanced by the conveyor device 6 along the second path P at a peripheral tangential velocity substantially equal to the linear velocity of the cigars 3 advancing along the first path P1. The retaining elements 24 carried by the arms 20 pivot on their axes to the point at which each relative groove 26 assumes a horizontal position and the mouthpiece 2 is able to align coaxially with the respective cigar 3. As the mouthpiece 2 approaches the cigar 3, a measure of radial movement will be induced, allowing it to engage with the end of the selfsame cigar 3.

[0040] It will be seen that for the attachment step to be made possible, the cigars 3 must be held fast by suitable restraining means of conventional type (not illustrated) forming part of the conveyor 38, and caused also to advance along the first path P1 synchronously with the advance of the mouthpieces 2 along the second path P.

[0041] Similarly, it will be observed that the arms 20, being pivotable each about the respective axis 21, are able to swing from side to side relative to the table 18, causing the single retaining elements 24 to describe a non-circular trajectory; this allows the mouthpieces 2, with or without a filter plug 9 fitted, to be offered to the cigars 3 by inducing a rotation of the single retaining element 24 that is not synchronous with the rotation of the remainder, and allowing optimization of the single operations carried out at the aforementioned stations 4', 8' and 7'.

Claims

1. A unit for the attachment of mouthpieces to cigars advancing along a first predetermined path (P1),
   characterized
   in that it comprises a device (5) for transferring and attaching the mouthpieces (2), positioned along a second predetermined path (P) and comprising in its turn a conveyor device (6) by which the mouthpieces (2) are advanced at least between a first distributing station (4') and a station (5') at which the mouthpieces are attached to respective cigars (3).

2. A unit as in claim 1, comprising a distributor device (4) operating at the first distributing station (4') and including means (36) by which the mouthpieces (2) are supplied to the transfer and attachment device (5).

3. A unit as in claim 2, wherein supply means (36) comprise a first singulator device (11) by which the mouthpieces (2) are arranged into an ordered succession (12').

4. A unit as in claim 3, wherein the first singulator device (11) comprises a vibrating container (10).

5. A unit as in claim 3 or claim 4, wherein supply means (36) comprise take-up means (14) operating on the first succession (12') in such a way as to distribute the mouthpieces (2) to the transfer and attachment device (5).

6. A unit as in claim 5, wherein take-up means (14) comprise a first and a second fluted roller (15, 16) disposed substantially tangential one to the other and rotatable thus about vertical axes, of which the first roller (15) presents a plurality of aspirating grooves (17) serving each to accommodate and retain a single mouthpiece (2), and the second roller (16) operates in conjunction with the first roller (15) to ensure that the mouthpieces (2) are positioned correctly in the relative grooves (17).

7. A unit as in claims 1 to 6, wherein the transfer and application device (5) comprises at least one arm (20) extending from a rotary table (18) and capable of movement along the second path (P) between a position in which the mouthpieces (2) are received at the distributing station (4'), and a position in which the mouthpieces (2) are joined to the cigars (3) at the attachment station (5').

8. A unit as in claim 7, wherein the arm (20) is associated rotatably with the table (18) by way of a first end (22) and capable of angular movement about the axis (21a) of a mounting pivot (21).

9. A unit as in claim 8, wherein the transfer and application device (5) further comprises an element (24) associated with a free second end (23) of the arm (20), of which the function is to retain the mouthpieces (2).

10. A unit as in claim 9, wherein the retaining element (24) is mounted pivotably to the second end (23) of the arm (20) and rotatable through the agency of actuator means (24a) about an axis (25) disposed substantially transverse to the axis (21a) of the mounting pivot (21).

11. A unit as in claim 10, wherein the second end (23) of the arm (20) is embodied as a clevis and the retaining element (24) is inserted between the mem-

bers (23a) of the second end (23).

12. A unit as in claims 9 to 11, wherein the single mouthpiece (2) is retained within an aspirating groove (26) presented by the element (24).

13. A unit as in claims 1 to 12, comprising means (31, 33) installed at a second distributing station (8') located downstream of the first distributing station (4'), relative to the second path (P), by which a filter plug (9) is inserted into each mouthpiece (2).

14. A unit as in claim 13, comprising means (37) installed likewise at the second distributing station (8'), by which filter plugs (9) are supplied to the mouthpieces (2).

15. A unit as in claim 14, wherein supply means (37) comprise a second singulator device (28) serving to establish an ordered succession (29) of the filter plugs (9).

16. A unit as in claim 15, wherein the second singulator device (28) comprises a second vibrating container (27).

17. A unit as in claim 14, wherein supply means (37) comprise a cutter device (34) by which single filter plugs (9) are separated from a continuous filter rod (35) and advanced in an ordered succession (29).

18. A unit as in claim 15 or claim 17, wherein supply means (37) comprise means (39) by which each of the single filter plugs (9) advancing in ordered succession (29) is taken up and aligned with a respective mouthpiece (2).

19. A unit as in claim 18, wherein take-up means (39) comprise a rotating disc (31) affording radial slots (32) by which the filter plugs (9) are positioned each in axial alignment with a corresponding mouthpiece (2).

20. A unit as claims 1 to 19, wherein means (31, 33) for inserting the filter plug (9) into the mouthpiece (2) comprise pushing means (33).

21. A unit as in claims 1 to 20, comprising a gumming device (7) positioned along the second path (P) at a point between the first distributing station (4') and the attachment station (5').

22. A unit as in any of claims 7 to 21, wherein the transfer and attachment device (5) comprises a plurality of arms (20).

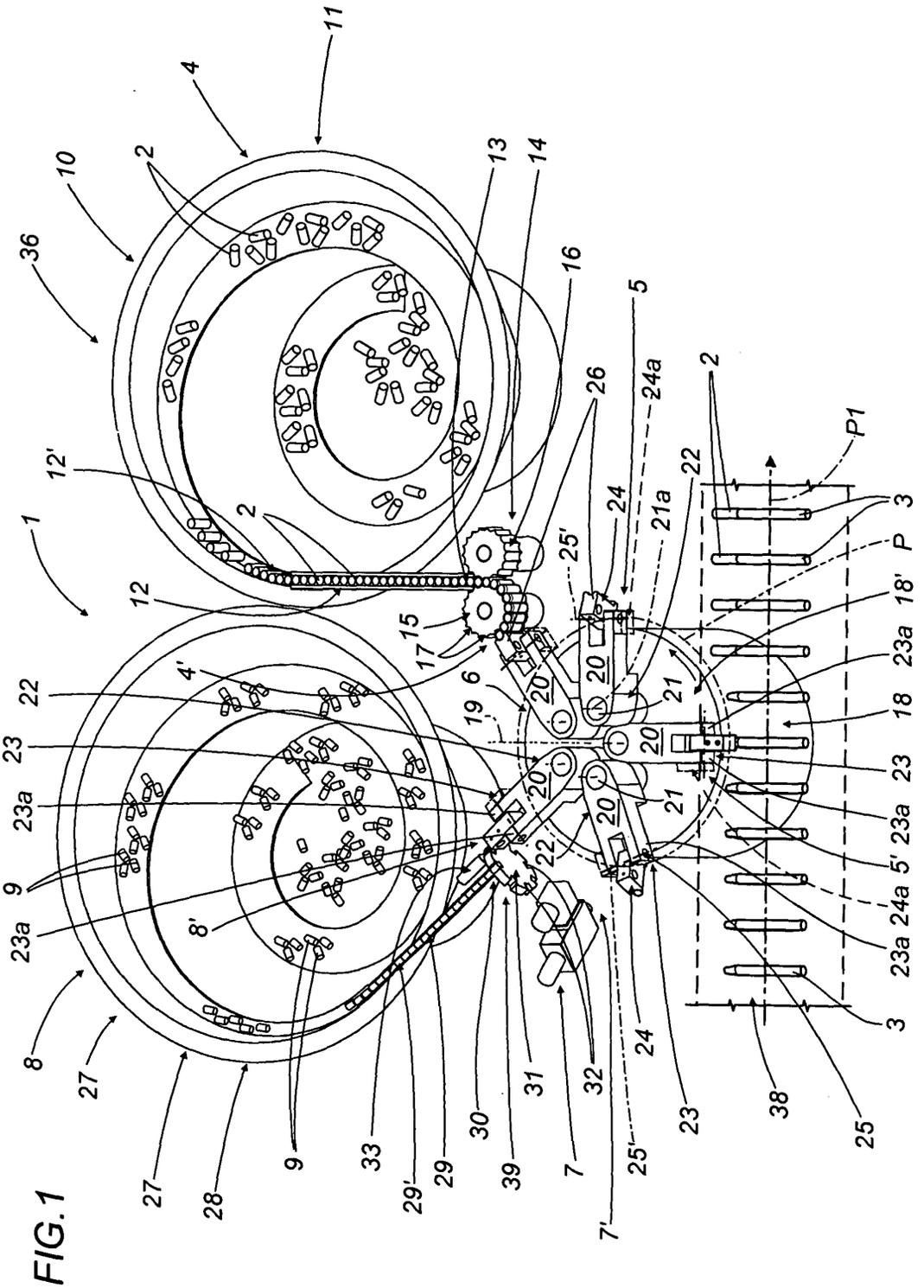
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FIG.1

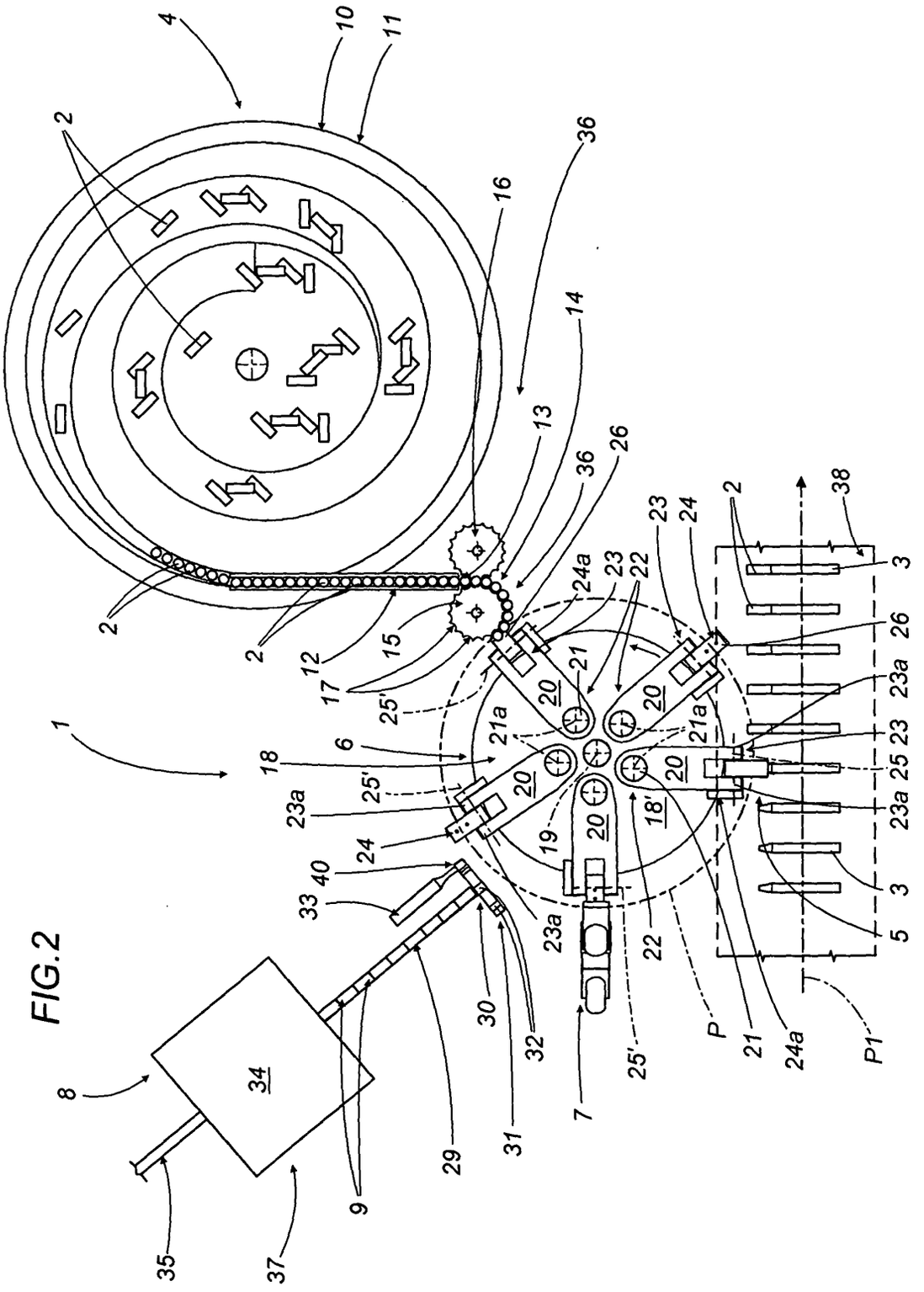
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FIG.2

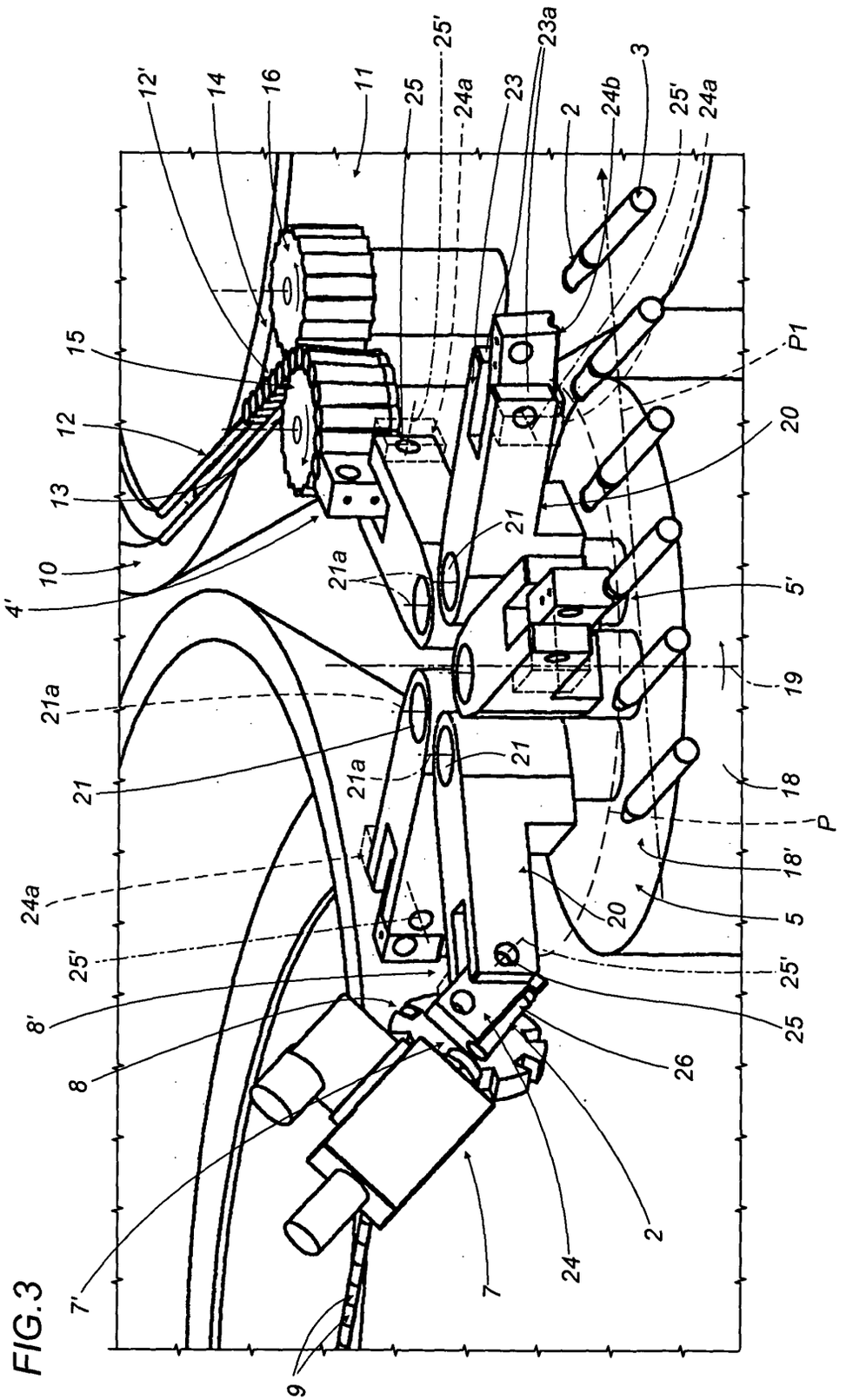
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FIG.3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 42 5021

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	GB 674 384 A (KORBER KURT; EUGENE KOPIR) 25 June 1952 (1952-06-25) * the whole document * -----	1	A24C5/47
A	US 4 605 014 A (WAHLE GUENTER) 12 August 1986 (1986-08-12) * the whole document * -----	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

A24C
A24F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	9 May 2005	MARZANO MONTEROSSO

CATEGORY OF CITED DOCUMENTS

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