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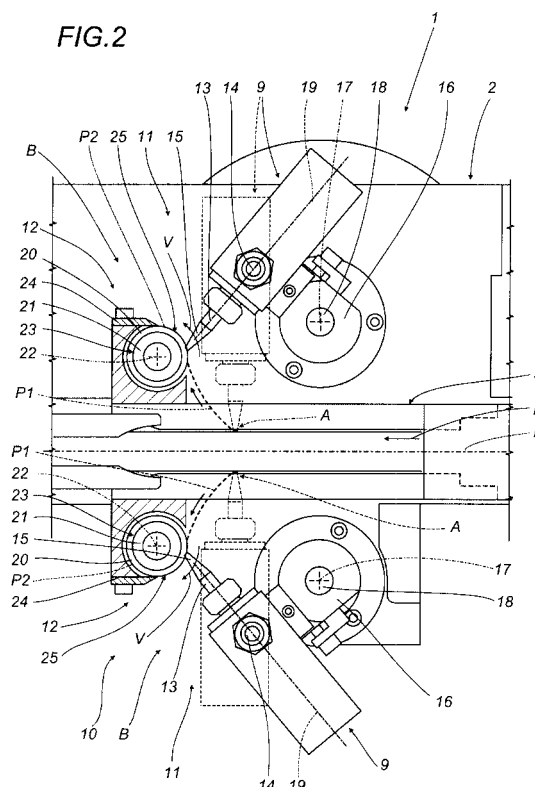
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(54) **A gumming unit**

(57) A gumming unit (10) is equipped with at least one gumming device (9) having a nozzle (13) and a relative applicator (15) delivering an adhesive, also an occluding and cleaning device (12) by which the orifice of the applicator (15) is closed and wiped during pauses in the gumming operations; the gumming device (9) is power driven so as to render the applicator (15) capable of movement back and forth along a first path (P1) between an operating position (A) and an at-rest position (B), whilst the occluding and cleaning device (12) is capable of movement in one direction (V) only, along a second path (P2) merging with the first path (P1) in the neighbourhood of the at-rest position (B). The occluding and cleaning device (12) is passive, its movement induced by the applicator (15) when assuming the at-rest position (B).

FIG.2



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Description

[0001] The present invention relates to a gumming unit. The invention finds application to particular advantage in the art field of machines for the manufacture of tobacco products, namely cigarettes and the like, to which explicit reference is made throughout the following specification albeit with no limitation in scope implied.

[0002] The need exists in such machines for an adhesive substance to be spread along one longitudinal side edge of a continuous strip of paper that will be rolled ultimately around a ribbon of tobacco filler to fashion a continuous cylindrical cigarette rod. It is standard practice in machines of the type in question to employ a gumming unit disposed facing a pass line along which the aforementioned continuous strip of paper is advanced; such a unit comprises at least one gumming device with a nozzle connected to a circuit by which the adhesive substance is supplied, and presenting an orifice that functions as an applicator from which the selfsame adhesive substance is delivered.

[0003] Gumming units of the conventional type described above betray the drawback that the nozzles require frequent cleaning, due in particular to the fact that residues of the adhesive substance tend to dry on the applicators whenever a temporary stoppage occurs during operation of the machine.

[0004] In most cases the cleaning operations are performed manually by an operator during the intervals when the machine is at a standstill.

[0005] The prior art also embraces gumming units furnished with devices by which the relative gumming devices are cleaned automatically. These units, however, are affected by drawbacks associated above all with the bulk and complexity of the automatic cleaning devices.

[0006] For example, the prior art embraces gumming units of a type comprising at least one gumming device, equipped with an element that serves to occlude the applicator of the device; the occluder element is shifted away from and toward the applicator during each pause in gumming operations, moving between a position in which the orifice of the applicator is closed, when a pad fixed to one end of the occluder is located in contact with the selfsame applicator, and a position in which the applicator is open, when the pad is washed clean by an atomized liquid substance sprayed onto its surface.

[0007] In this type of gumming unit, a special device is required to deliver the atomized liquid substance used for washing the pad. The device is somewhat costly and cumbersome as it comprises a battery of atomizer nozzles connected to a circuit supplying the liquid substance, which is held in a tank and delivered by a pump.

[0008] Also, this type of gumming unit is unsuitable for cigarette making machines of conventional design, in which the space around the applicator generally is not sufficient to accommodate a movable pad of the type mentioned above.

[0009] The object of the present invention is to provide a gumming unit equippable with an automatic cleaning device whilst relatively simple and economical and of compact dimensions.

[0010] The stated object is realized in a gumming unit according to the present invention, comprising at least one gumming device having a nozzle equipped with a relative applicator from which an adhesive substance is delivered, also occluding and cleaning means serving to close and wipe the orifice of the applicator during pauses in gumming operations, characterized in that the gumming device is movable in embodiment and the relative applicator capable thus of movement along a first predetermined path between an active gumming position and an at-rest position, in that the unit comprises drive means by which the applicator is moved between the gumming and at-rest positions, and in that the occluding and cleaning means are capable of movement along a second predetermined path of which a given section merges with the first path and coincides with the at-rest position.

[0011] More particularly, the occluding and cleaning means are capable of movement unidirectionally along the second path in a predetermined direction, and their movement along the second path in the predetermined direction is induced by the gumming applicator in the course of assuming the at-rest position.

[0012] The invention will now be described in detail, by way of example, with the aid of the accompanying drawings, in which:

- fig 1 illustrates a preferred embodiment of the gumming unit according to the present invention, shown in a schematic plan view with certain parts in section and others omitted for clarity, and seen in a first predetermined moment of operation;
- fig 2 shows the gumming unit of fig 1 in a second predetermined moment of operation;
- fig 3 illustrates the gumming unit of fig 2 in a schematic front elevation, with parts omitted for clarity;
- fig 4 illustrates the gumming unit of fig 1 in a schematic side elevation, with certain parts shown in section and others omitted for clarity.

[0013] With reference to fig 1 of the drawings, 1 denotes a portion, in its entirety, of a cigarette-making machine (not illustrated).

[0014] The machine, more exactly, is a cigarette maker of the type disclosed in US Pat 4,336,812 by which two cigarette rods are fashioned simultaneously.

[0015] As discernible to advantage in fig 4, the portion 1 illustrated comprises a bed 2 carrying a beam 3 on which two continuous cylindrical cigarette rods 4 are formed.

[0016] The beam 3 follows a rectilinear and substantially horizontal path P along which the cigarette rods 4 are formed, and affords two channels 5 of varying section each accommodating a respective rod 4.

[0017] Each channel 5 establishes a pass line along which a respective cigarette rod 4 is fed and formed in a predetermined direction D.

[0018] A continuous strip 6 of paper is directed along each channel 5 following the pass direction D, in conventional manner, and a continuous ribbon of tobacco filler (not illustrated) deposited on the advancing paper. As the strips 6 of paper are fed along the two forming lines, each is constrained gradually by the changing section of the relative channel 5, again in conventional manner, to envelop the respective tobacco filler (not illustrated) and ultimately assume a cylindrical shape. Immediately before assuming the final cylindrical shape, each strip 6 advances with one longitudinal side edge 7 projecting upwards through a vertical slot 8 in the beam 3 and engaging in contact with a respective gumming device 9 that forms part of a gumming unit denoted 10 in its entirety.

[0019] As shown to advantage in fig 4, the gumming unit 10 and the beam 3 occupy positions substantially of symmetry in relation to a vertical plane S lying between the two pass lines along which the rods 4 are fed and formed. More exactly, the two inside faces of the side edges 7 and the relative gumming devices 9 are oriented respectively in opposite directions on either side of the plane S.

[0020] For the sake of simplicity, only the portion of the gumming unit 10 involved in forming one of the two cigarette rods 4 will be described in the course of the specification.

[0021] The aforementioned portion of the gumming unit 10 is denoted 11 in its entirety and comprises, in addition to the gumming device 9, a device 12 by which the device 9 is occluded and cleaned during pauses in the gumming operations.

[0022] The gumming device 9 is mounted to the bed 2 and incorporates a nozzle 13, connected by way of a pipeline 14 to a circuit (not shown) from which an adhesive substance is delivered, and affording an orifice that serves as an applicator 15 by which the adhesive substance is metered and spread along the aforementioned side edge 7 of the respective strip 6.

[0023] The device 9 is mounted rigidly to a substantially cylindrical boss 16 rotatable about a substantially vertical axis 17 and keyed to the output shaft 18 of a motor (not indicated), in such a way that the device 9 can be made to describe a predetermined rotation about the axis 17 and the applicator 15 thus caused to travel along a first predetermined path P1 between an active gumming position A (figs 1 and 4) and an at-rest position B (figs 2 and 3). More exactly, the gumming device 9 is positioned on the cylindrical boss 16 in such a manner that when the applicator 15 occupies the gumming position A, the axis 19 of the nozzle 13 will be disposed at right angles to the pass direction D, substantially horizontal and angled marginally downwards in the direction transverse to the selfsame direction D. The occluding and cleaning device 12 is mounted to the bed 2 and po-

sitioned alongside the beam 3 at a point beyond the gumming device 9, relative to the pass direction D.

[0024] The device 12 consists in a substantially tubular pad 20 of sponge material impregnated preferably with water or with whatever substance will dissolve the adhesive substance, such as will occlude the relative applicator 15 when occupying the at-rest position B (figs 2 and 3), and a wheel 21 rotatable about an axis 22 disposed parallel to the axis 17 of the boss 16, of which the peripheral cylindrical surface 23 provides a support for the pad 20. As discernible from fig 2, the wheel 21 is rotatable freely and unidirectionally about the respective axis 22 along a second predetermined path P2, in a direction V opposite to the direction of rotation of the gumming device 9 when moving along the first predetermined path P1 from the gumming position A to the at-rest position B.

[0025] The second path P2 merges with the first path P1 for a given distance at a point coinciding with the at-rest position B.

[0026] Lastly, the occluding and cleaning device 12 is equipped with a scraper blade 24 positioned in tangential contact with the pad 20 at a point remote from the beam 3 and the gumming device 9. The operation of the gumming unit 10 will now be described, starting from a situation in which the two gumming devices 9 occupy their active gumming positions A (figs 1 and 4) and the applicators 15 are offered in contact to the inside faces of the side edges 7 presented by the respective strips 6 as these advance along the pass direction D, each in the respective channel 5.

[0027] Whenever there is a pause in the operation of the cigarette making machine, a master controller (not illustrated) will pilot the gumming devices 9 to rotate about the respective axes 17 in such a way as to direct each applicator 15 along the relative path P1 toward the at-rest position B.

[0028] On reaching the at-rest position B, where the first and second predetermined paths P1 and P2 coincide, each applicator 15 engages and drags the relative pad 20 in rotation about the relative axis 22, in the direction denoted V.

[0029] When in the at-rest position B, both applicators 15 are occluded by the respective pads 20, and more exactly, each applicator 15 is partially buried in the relatively soft sponge material from which the pad 20 is fashioned.

[0030] As the machine resumes operation, the controller (not illustrated) pilots the gumming devices 9 to rotate about the respective axes 17 in the opposite direction, or rather in such a way as to return the applicators 15 along the respective predetermined paths P1 toward the initial gumming position A. Passing from the at-rest position B to the gumming position A, each applicator 15 brushes against the corresponding pad 20 which on this occasion remains motionless, for the reasons described above, in the position assumed previously. As a result the pad 20 performs a wiping action

of which the effect is to clean the applicator 15.

[0031] It will be observed that with each successive pause in the operation of the cigarette making machine, the single pad 20 makes a discrete angular movement about the respective axis 22 in the predetermined direction of rotation V, and a clean portion of the outer surface 25 is brought thus into a position of readiness to engage the applicator 15 when the next pause occurs.

[0032] In the course of each rotation, moreover, the outer surface 25 of the pad 20 is cleaned by the scraper blade 24.

[0033] Notwithstanding the gumming unit according to the present invention is described and illustrated in the context of a cigarette maker equipped to turn out two cigarette rods, it will be obvious that the same unit might be used to equally good effect in a single rod type of machine or more generally in a machine for manufacturing or packaging products of whatever nature.

determined direction (V).

5. A unit as in claim 4, wherein the second path (P2) is a circular path, the pad (20) is substantially tubular, and the support means (21) consist in a wheel (21) delimited by a cylindrical peripheral surface (23) supporting the pad (20).
6. A unit as in claim 4 or 5, wherein the occluding and cleaning means (12) comprise scraper means (24) of which the function is to clean the pad (20).
7. A unit as in claims 4 to 6, wherein the pad (20) is impregnated with a substance capable of dissolving the adhesive substance.

Claims

1. A gumming unit, comprising at least one gumming device (9) having a nozzle (13) equipped with a relative applicator (15) from which an adhesive substance is delivered, also occluding and cleaning means (12) serving to close and wipe the orifice of the applicator (15) during pauses in gumming operations, characterized in that the gumming device (9) is movable in embodiment and the relative applicator (15) capable thus of movement along a first predetermined path (P1) between an active gumming position (A) and an at-rest position (B); in that the unit (10) comprises drive means (18) by which the applicator (15) is moved between the gumming and at-rest positions (A, B); and in that the occluding and cleaning means (12) are capable of movement along a second predetermined path (P2) of which a given section merges with the first path (P1) and coincides with the at-rest position (B).
2. A unit as in claim 1, wherein the occluding and cleaning means (12) are capable of movement along the second path (P2) unidirectionally and in a predetermined direction (V).
3. A unit as in claim 2, wherein the movement of the occluding and cleaning means (12) along the second path (P2) and in the predetermined direction (V) is induced by the applicator (15) when assuming the at-rest position B.
4. A unit as in claim 3, wherein the occluding and cleaning means (12) comprise a pad (20) by which the orifice of the applicator (15) is closed when occupying the at-rest position (B), and means (21) by which the pad (20) is supported, both capable of movement along the second path (P2) in the pre-

FIG.1

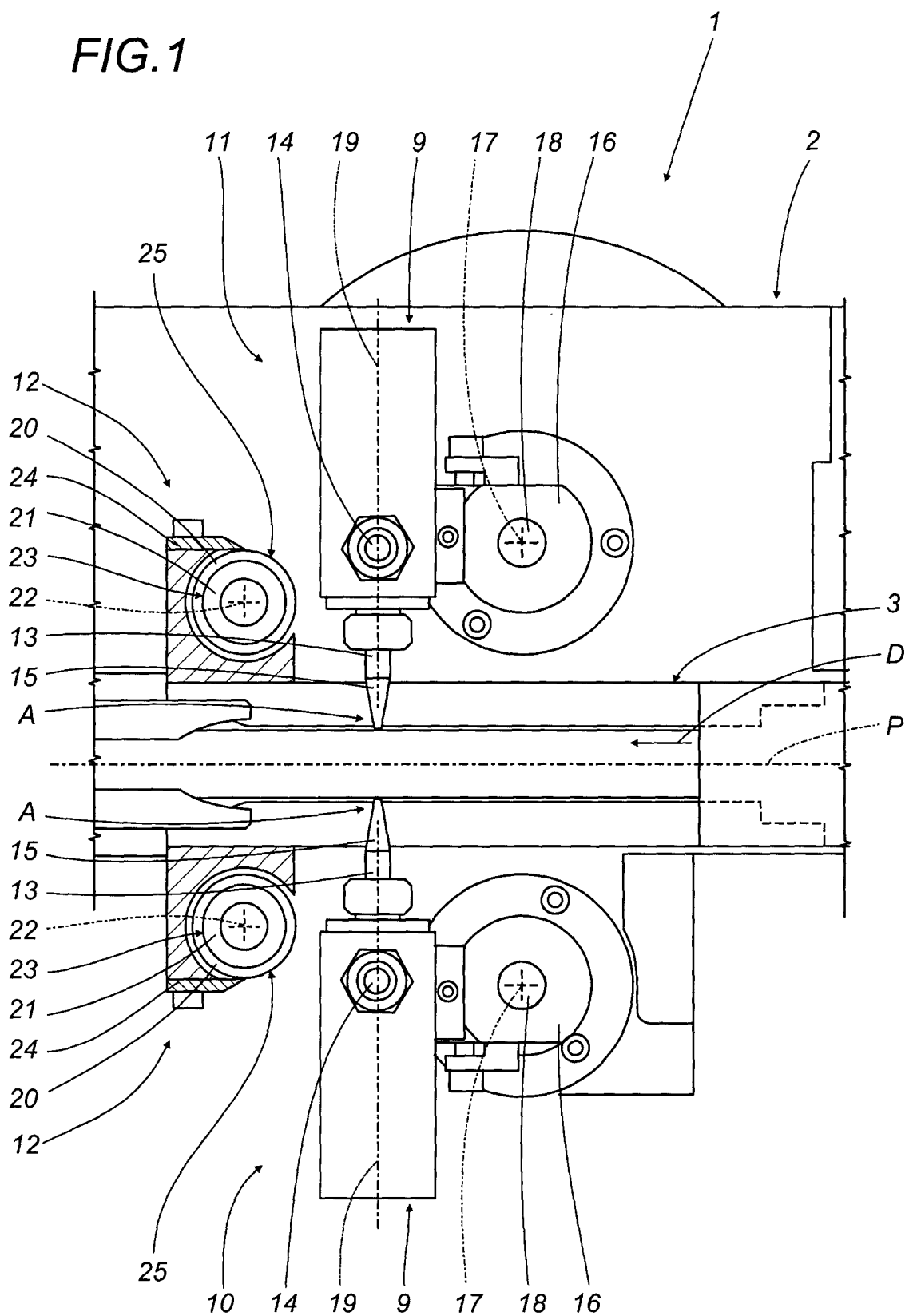
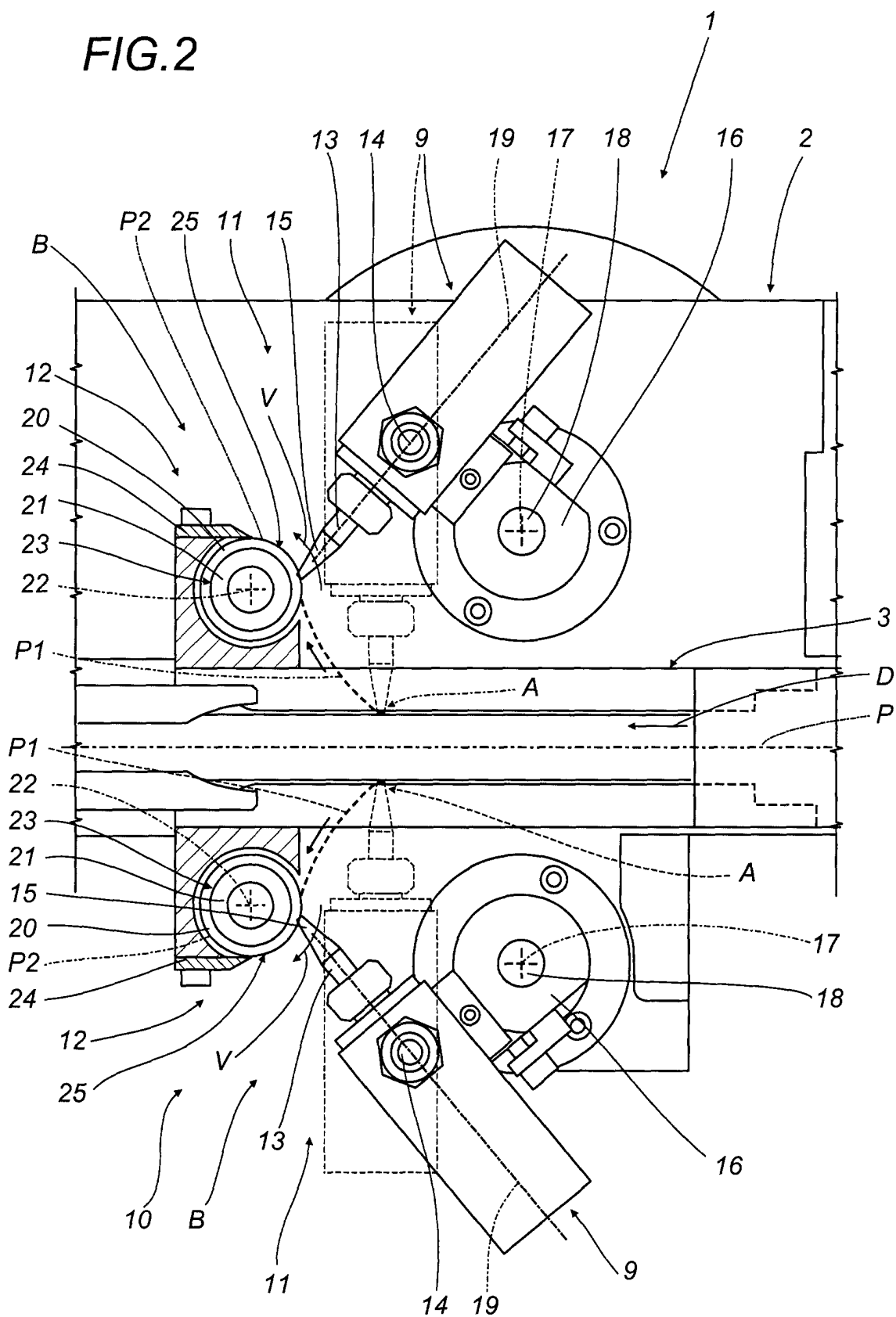
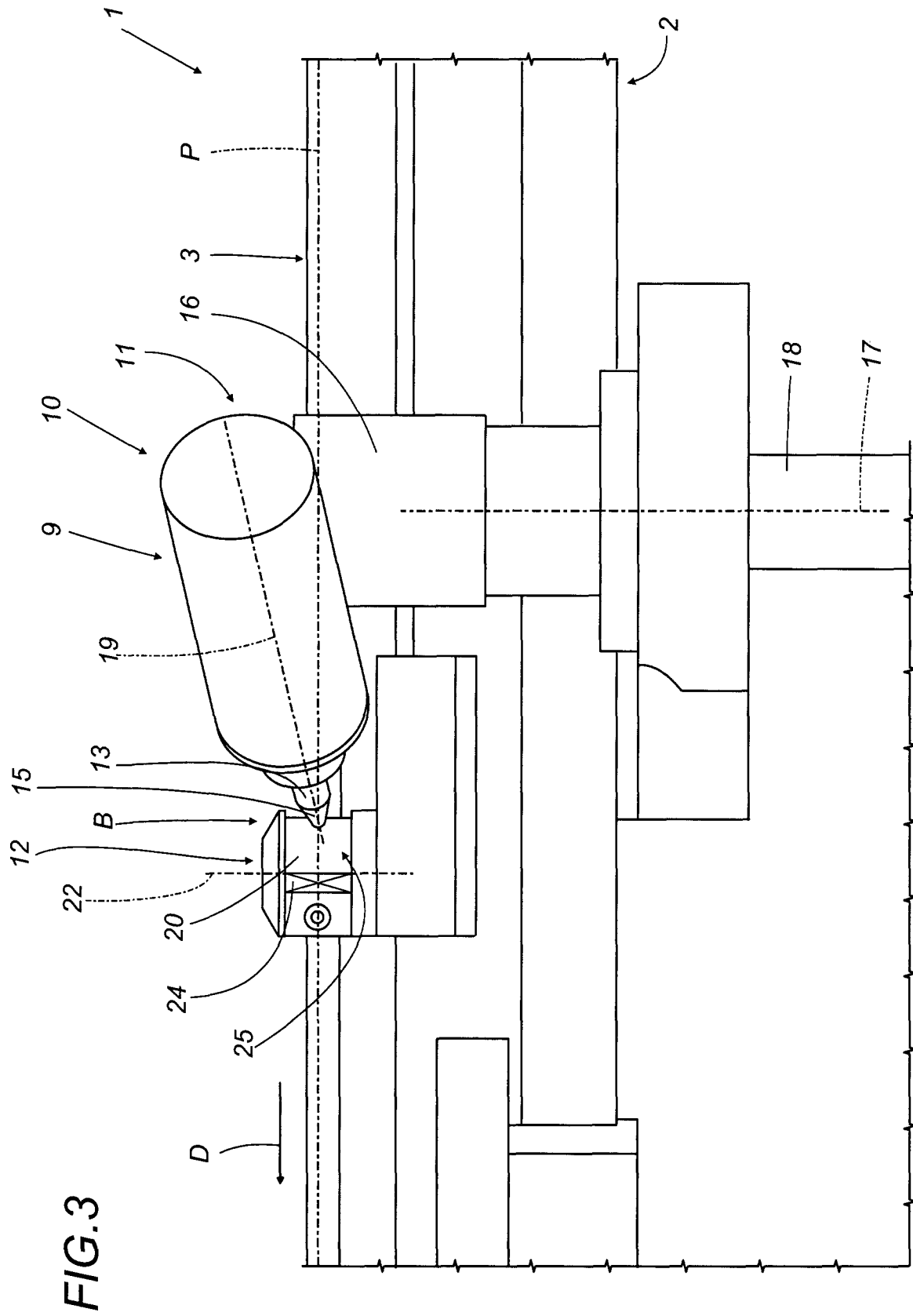
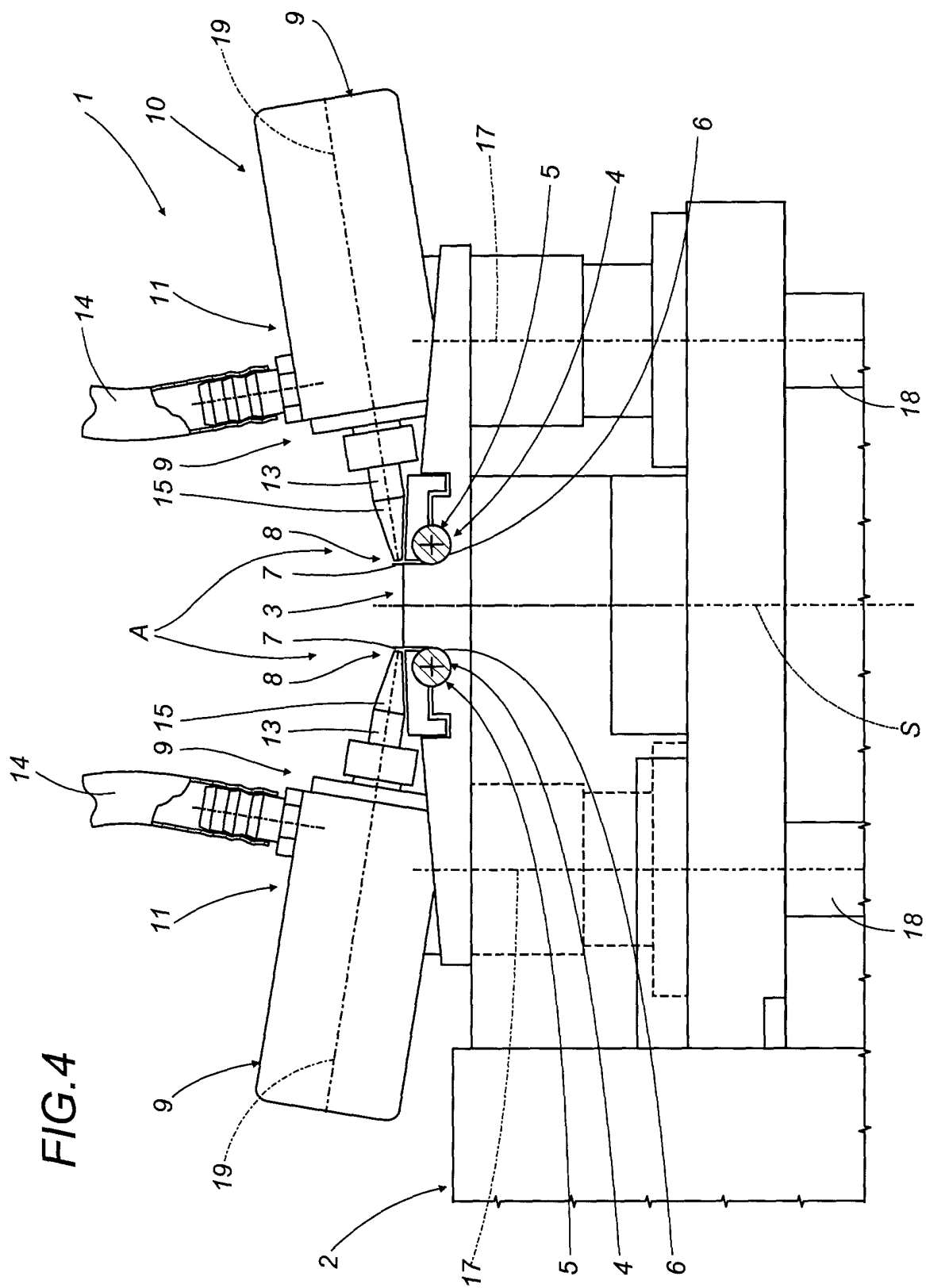


FIG.2









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EUROPEAN SEARCH REPORT

Application Number
EP 01 83 0049

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	DE 196 39 260 A (TOPACK VERPACKUNGSTECHNIK) 26 March 1998 (1998-03-26) * column 3, line 27 - column 4, line 3; figures 4-7 *	1,2	A24C5/24 B05B15/02
A	---	3-5,7	
X	US 5 853 812 A (KAWASAKI) 29 December 1998 (1998-12-29) * column 5, line 14 - column 8, line 9; figures 2,3 *	1-7	
A	---	1	
A	EP 0 876 855 A (FOCKE & CO) 11 November 1998 (1998-11-11) * column 5, line 48 - column 6, line 33; figure 6 *	1	
A	---	1	
A	US 5 766 356 A (KURIMOTO) 16 June 1998 (1998-06-16) * column 4, line 17 - column 7, line 50; figure 1 *	1	
A	---	1	A24C B05B B65B
A	US 4 704 308 A (MANEKE) 3 November 1987 (1987-11-03) * the whole document *	1	
A	---	1	
A	GB 2 278 991 A (MOLINS PLC) 21 December 1994 (1994-12-21) * the whole document *	1	
A	---	1	
P,X	US 2 606 521 A (WRAY) 12 August 1952 (1952-08-12) * the whole document *	1,2	

	EP 1 000 863 A (FOCKE & CO) 17 May 2000 (2000-05-17) * column 5, line 37 - column 7, line 5; figures 6-8 *		

The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		10 April 2001	Riegel, R
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
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 83 0049

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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10-04-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 19639260 A	26-03-1998	NONE	
US 5853812 A	29-12-1998	JP 10076205 A	24-03-1998
EP 876855 A	11-11-1998	DE 19719198 A	12-11-1998
		BR 9801605 A	27-04-1999
		CN 1199007 A	18-11-1998
		JP 11049118 A	23-02-1999
US 5766356 A	16-06-1998	JP 2997637 B	11-01-2000
		JP 9019654 A	21-01-1997
		JP 3105161 B	30-10-2000
		JP 9070564 A	18-03-1997
		US 5876500 A	02-03-1999
US 4704308 A	03-11-1987	DE 3509730 A	18-09-1986
		CA 1271027 A	03-07-1990
		ES 553045 D	16-05-1987
		ES 8705783 A	01-08-1987
		IT 1192052 B	31-03-1988
		JP 2097699 C	02-10-1996
		JP 8015578 B	21-02-1996
		JP 61212356 A	20-09-1986
GB 2278991 A	21-12-1994	DE 4421124 A	22-12-1994
		IT 1272287 B	16-06-1997
		JP 7067612 A	14-03-1995
		US 5479947 A	02-01-1996
US 2606521 A	12-08-1952	NONE	
EP 1000863 A	17-05-2000	DE 19851775 A	11-05-2000
		BR 9905316 A	12-09-2000
		CN 1253101 A	17-05-2000
		JP 2000142632 A	23-05-2000