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(54) Gumming device

(57) A gumming device (1) for applying glue (2) to a continuous web (3) of sheet material, in which a gumming roller (4) and dispensing roller (6) which are substantially cylindrical and are positioned parallel to each other are maintained in mutual contact along a common generating line (21) by a thrust device (20) and cooperate with a closure element (25) to define a chamber (27) for feeding the glue (2) to the gumming roller (4); the chamber (27) has a substantially triangular cross-section with a vertex lying on the common generating line (21) in a position facing the closure element (25), and forms part of a closed flow circuit (34) for the glue (2).

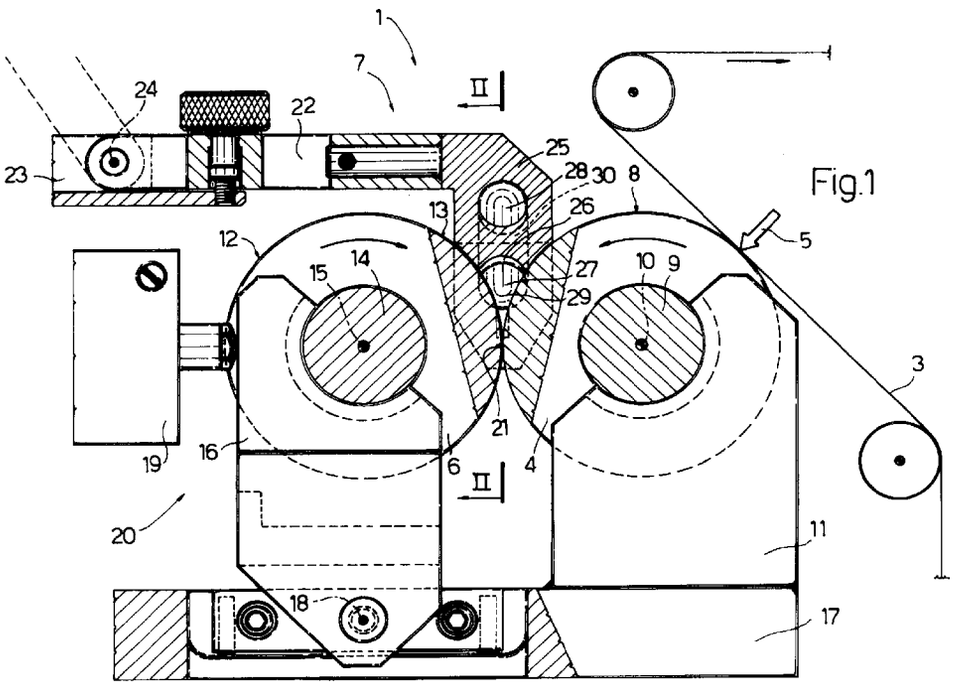

Fig.1

EP 0 862 951 A1

Description

This invention relates to a gumming device, and in particular to a gumming device for applying glue to sheet material.

The invention can be advantageously used, for example, to apply glue to a continuous web of paper material in sheet form used to form connection bands between filters and relative cigarette stems.

The chemical and/or physical characteristics of glue normally used in gumming processes often undergo more or less considerable alteration during its passage through gumming devices of known type.

In particular, with specific reference to known gumming devices of the so-called "roller" type, the main causes of degradation of said characteristics are the partial exposure of a significant glue quantity to the air with consequent partial deterioration of the glue, and the prolonged stagnation of the glue in regions in which the glue undergoes excessive working.

GB-A-919740 describes a gumming device in which a gumming roller and a dispensing roller, arranged parallel to each other and maintained in mutual contact along a common generating line by a presser device, receive glue from a container positioned above the two rollers, and which lowerly comprises an aperture closed in a substantially sealed manner by the two rollers themselves. The glue leaves the container along said common generating line, so that a quantity determined by the action of the dispensing roller spreads over the surface of the gumming roller.

Although the problem due to partial exposure of the glue to air with consequent partial drying of the glue is only marginally present, said gumming device has however the drawback that the gumming roller is fed with glue which has remained for a more or less lengthy time within the region above the two rollers, whereas it would be preferable to feed the gumming roller always with fresh glue to ensure more constant and homogeneous glue characteristics.

The object of the present invention is to provide a gumming device which eliminates the drawbacks described with reference to the known art.

The present invention provides a gumming device for applying glue to a continuous web of sheet material, the device comprising a gumming roller having a substantially cylindrical lateral surface arranged to transfer a determined glue quantity to the continuous web; a dispensing roller having a substantially cylindrical lateral surface and positioned parallel to the gumming roller and tangential to the gumming roller along a generating line parallel to the two rollers; thrust means for ensuring a determined contact pressure between the two rollers along said common generating line; and means for feeding glue to said rollers, said feed means comprising a closure element cooperating with said lateral surfaces to define a chamber having a substantially triangular cross-section with a vertex lying on the common generating line in a position facing the closure element; characterised in that said chamber forms part of a closed glue flow circuit, said closed circuit forming part of said feed means.

The invention is described hereinafter with reference to the accompanying drawings, which illustrate a non-limiting embodiment thereof and in which:

Figure 1 is a schematic view of a gumming device formed in accordance with the present invention;
Figure 2 is a schematic side section through the device shown in Figure 1.

In the accompanying figures, the reference numeral 1 indicates overall a gumming device for applying glue 2 to a continuous web of sheet material intended, in the illustrated case, for forming connection bands (not shown) between filters (not shown) and relative cigarette stems (not shown) in a filter fitting machine (not shown).

The device 1 comprises a gumming roller 4 arranged to apply a measured quantity of glue 2 to the web 3 at a gumming station 5; a dispensing roller 6 arranged to cooperate with the gumming roller 4 to dispense the quantity of glue 2 to be applied to the web 3; and a device 7 for feeding glue 2 to the two rollers 4 and 6.

The gumming roller 4 is bounded externally by a cylindrical lateral surface 8 substantially tangential to the web 3 at the station 5, and is supported by a central shaft 9 coaxial to a horizontal axis 10, to rotate in an anticlockwise direction in Figure 1 about the axis 10, relative to a fixed fork 11 under the thrust of an actuator device, not shown.

The dispensing roller 6 is provided with a substantially cylindrical outer surface 12 comprising depressed regions 13, and is keyed on a central shaft 14 coaxial to a substantially horizontal axis 15 parallel to the axis 10, with which the axis 15 defines a substantially horizontal plane. The shaft 14 is linked to the shaft 9 to cause the roller 6 to rotate about the axis 15 in a clockwise direction in Figure 1 and with a peripheral speed equal to that of the roller 4, and is rotatably supported by a fork 16 connected to a fixed frame 17 to oscillate relative to the frame 17 about an axis 18 parallel to the axes 10 and 15 under the thrust of an actuator 19 defining, with the fork 16, a thrust device 20 arranged to bring the surfaces 8 and 12 into mutual contact with a determined contact pressure along a common generating line 21 parallel to the axes 10 and 15.

Above the rollers 4 and 6 there is positioned an arm 22, which is transverse to the axes 10 and 15 and is hinged at one end to a fixed bracket 23 rigid with the frame 17, to oscillate relative to the bracket 23 about an axis 24 parallel to the axes 10 and 15.

At the opposite end to that connected to the bracket 23, the arm 22 carries a rigidly connected head 25 arranged above the rollers 4 and 6 and lowerly compris-

ing a recess 26. The arm 22 is arranged to oscillate about the axis 24 away from and towards a lowered position, in which the recess partially receives the rollers 4 and 6 and the surface of the recess 26 makes fluid-tight contact with the surfaces 8 and 12 of the rollers 4 and 6 and with the end surfaces of the rollers 4 and 6 to define, together with portions of the surfaces 8 and 12 located above the generating line 21, a substantially fluid-tight chamber 27.

The chamber 27 is of substantially triangular cross-section with a lower vertex lying on the generating line 21.

The feed device 7 comprises a delivery conduit 28 provided along the head 25 above the recess 26 and parallel to the axes 10 and 15, a return conduit 29 provided along the head 25 below and parallel to the conduit 28 and through the recess 26, a curved conduit 30 connecting together the conduits 28 and 29, and two tubular end connectors 31 and 32 by which the conduits 28 and 29 are connected to a fluid-tight container 33 for the glue 2.

When the head 25 is in its lowered position, the conduit 29 traverses the chamber 27 to define, together with the chamber 27 itself, with the conduits 28 and 30, with the connectors 31 and 32 and with the container 33, a closed circuit 34 through which the glue 2 is circulated at a pressure determined by a pump 35 positioned along the connector 31.

In use, before commencing gumming of the web 3, the thrust device 20 is operated to bring the surfaces 8 and 12 of the rollers 4 and 6 into tight mutual contact along the common generating line 21, and the head 25 is arranged in its lowered position to define the chamber 27 and hence form the circuit 34 through which the pump 35 then circulates the glue 2 at a determined pressure.

As a result of the rotation of the gumming roller 4, a part of the glue 2 fed under pressure into the chamber 27 adheres to the surface 8 and is dragged towards the generating line 21 to emerge from the chamber 27 along the generating line 21. By maintaining the surfaces 8 and 12 in tight mutual contact, the thrust device 20 limits the outflow of glue 2 to only that part of the glue 2 adhering to the depressed regions 13.

The roller 4 then transports the glue 2 withdrawn from the chamber 27 to the gumming station 5, where the glue 2 is transferred to the web 3.

During the rotation of the dispensing roller 6 a certain quantity of glue 2, by adhering to the interior of the depressed regions 13, leaves the chamber 27 to then re-enter the chamber 27 after only a short exposure to the air. This quantity is however so small that any partial drying of the glue 2 can be considered irrelevant.

Claims

1. A gumming device for applying glue (2) to a continuous web (3) of sheet material, the device (1) comprising a gumming roller (4) having a substantially cylindrical lateral surface (8) arranged to transfer a determined quantity of glue (2) to the continuous web (3); a dispensing roller (6) having a substantially cylindrical lateral surface (12) and positioned parallel to the gumming roller (4) and tangential to the gumming roller (4) along a generating line (21) parallel to the two rollers (4, 6); thrust means (20) for ensuring a determined contact pressure between the two rollers (4, 6) along said common generating line (21); and means (7) for feeding glue (2) to said rollers (4, 6), said feed means (7) comprising a closure element (25) cooperating with said lateral surfaces (8, 12) to define a chamber (27) having a substantially triangular cross-section with a vertex lying on the common generating line (21) in a position facing the closure element (25); characterised in that said chamber (27) forms part of a closed flow circuit (34) for the glue (2), said closed circuit (34) forming part of said feed means (7).

2. A device as claimed in claim 1, characterised in that said circuit (34) is a pressurized circuit.

3. A device as claimed in claim 1 or 2, characterised in that pump means (35) are provided for circulating the glue (2) through said circuit (34) at a determined pressure.

4. A device as claimed in claim 1, characterised in that said chamber (27) is a substantially fluid-tight chamber, said pump means (35) being arranged to feed glue (2) under pressure through said closed circuit (34) and through said chamber (27).

5. A device as claimed in claim 2, 3 or 4, characterised in that said closed circuit (34) is at least partly formed within the interior of said closure element (25).

6. A device as claimed in any one of the preceding claims, characterised in that said closure element (25) is an element movable between a position in contact with said rollers (4, 6), in which said chamber (27) is closed, and a position in which this latter is open.

7. A device as claimed in any one of the preceding claims, characterised in that said common generating line (21) is substantially horizontal; said closure element (25) being arranged above the common generating line (21).

8. A device as claimed in any one of the preceding claims, characterised in that the lateral surface (12) of said dispensing roller (6) comprises depressed regions (13) arranged to receive a determined quantity of glue (2) within said chamber (27) and to

transfer it to the outside of said chamber (27).

9. A gumming device substantially as described with reference to the accompanying drawings.

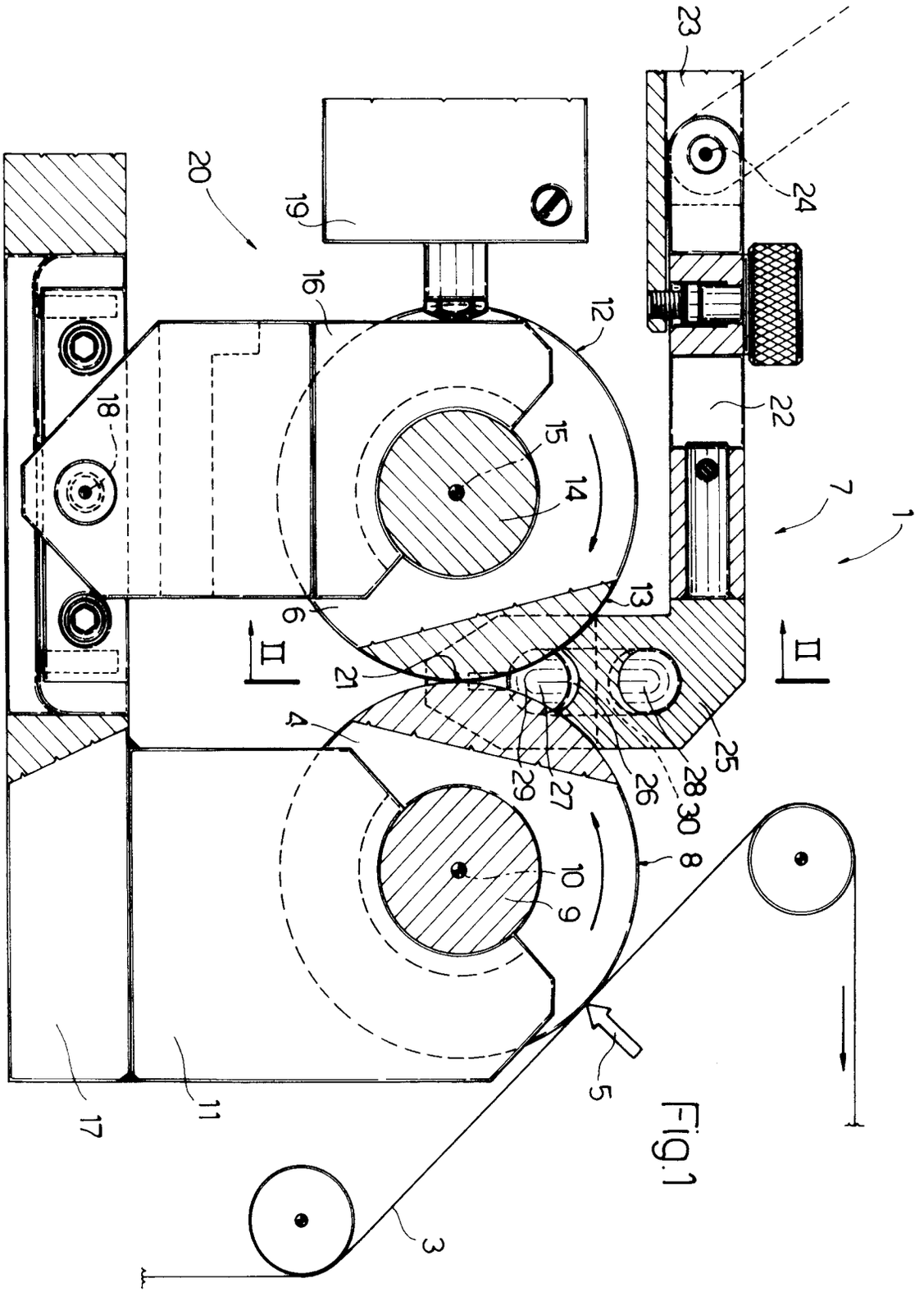
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Fig.1

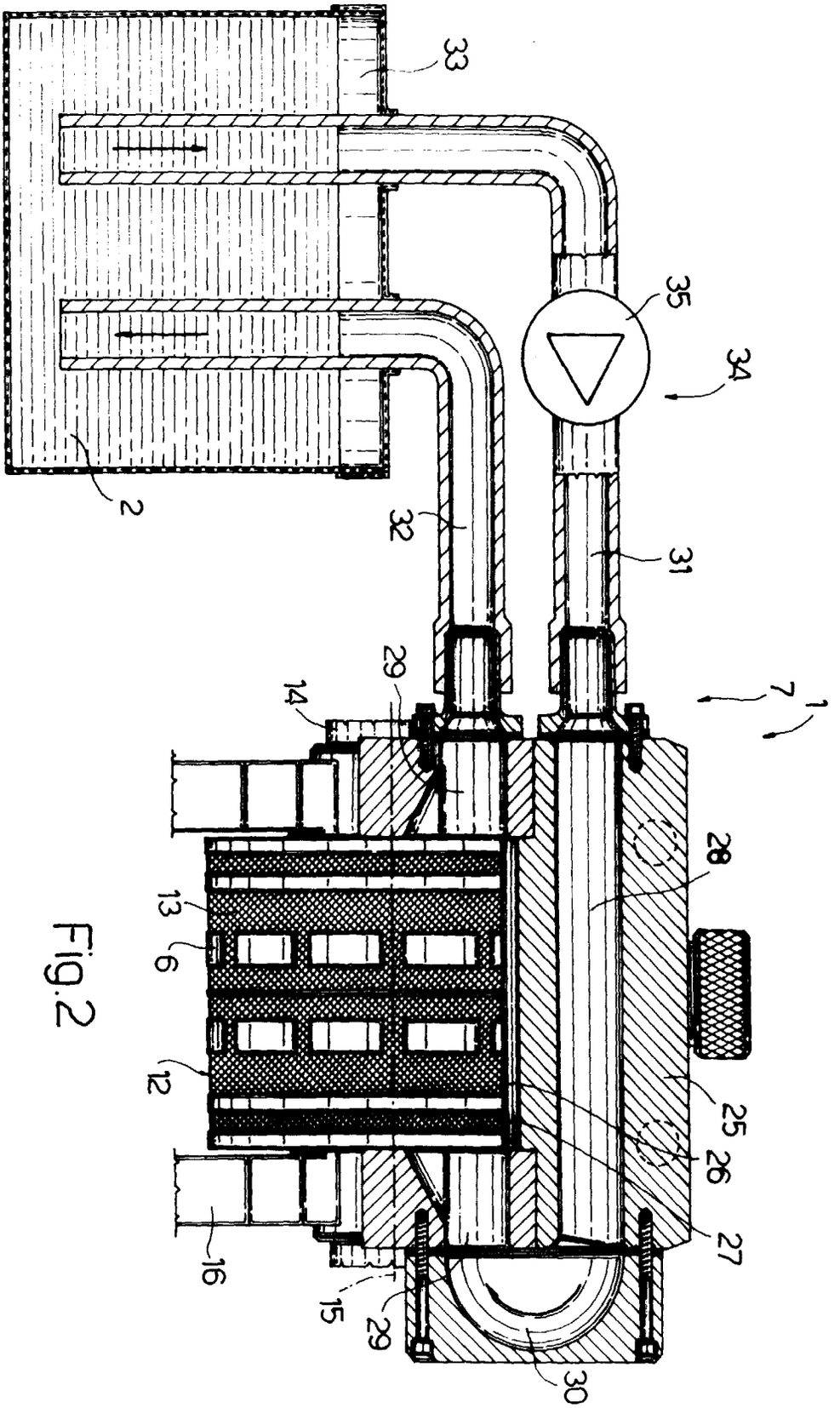

Fig.2

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EUROPEAN SEARCH REPORT

Application Number
EP 98 10 2692

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.6)
X	US 5 355 799 A (LUTZ NOELLE) 18 October 1994 * column 2, line 14 - line 37; figures *	1-9	B05C1/08 B05C1/16 A24C5/47
X	FR 2 084 196 A (ADOLF FRIZ GMBH) 17 December 1971 * page 4, line 36 - page 5, line 24 * * page 7, line 5 - line 9; figures *	1	
A,D	GB 919 740 A (TOM ROWLANDS & MOLINS MACHINE CO. LTD) * the whole document *	1	
A	EP 0 736 329 A (LTG LUFTTECHNISCHE GMBH) 9 October 1996 * column 3, line 37 - column 4, line 7; figures *	1,6	
A	GB 2 067 436 A (MOLINS LTD) 30 July 1981 * abstract; figures *	1	
A	US 2 912 959 A (F. W. SHOWALTER) 17 November 1959 * column 2, line 24 - line 72; figures *	1,2	TECHNICAL FIELDS SEARCHED (Int.Cl.6) B05C A24C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28 May 1998	Brévier, F

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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