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(54) **Device for spreading adhesive films on fabrics, membranes or the like**

(57) Device (10) for spreading films (11) of adhesive (12) on fabrics (13), membranes or the like, comprising a frame (14) that supports

- a dosage roller (15), which can rotate about a first rotation axis (A),
- a spreading roller (16), which can rotate about a second rotation axis (B),
- a roller (17) for pressing the fabric (13) against the spreading roller (16) to spread the fabric (13) with a film (11) of adhesive (12),

- means (18) for the mutually adjacent arrangement of the dosage roller (15) against the spreading roller (16),
- means (20) for the mutual inclination of the dosage roller (15) with respect to the spreading roller (16), which can be actuated by actuation means in order to pass from a first configuration, in which the first axis of rotation (A) is parallel to the second axis of rotation (B), to second configurations, in which the first axis of rotation (A) and the second axis of rotation (B) are mutually oblique, and vice versa.

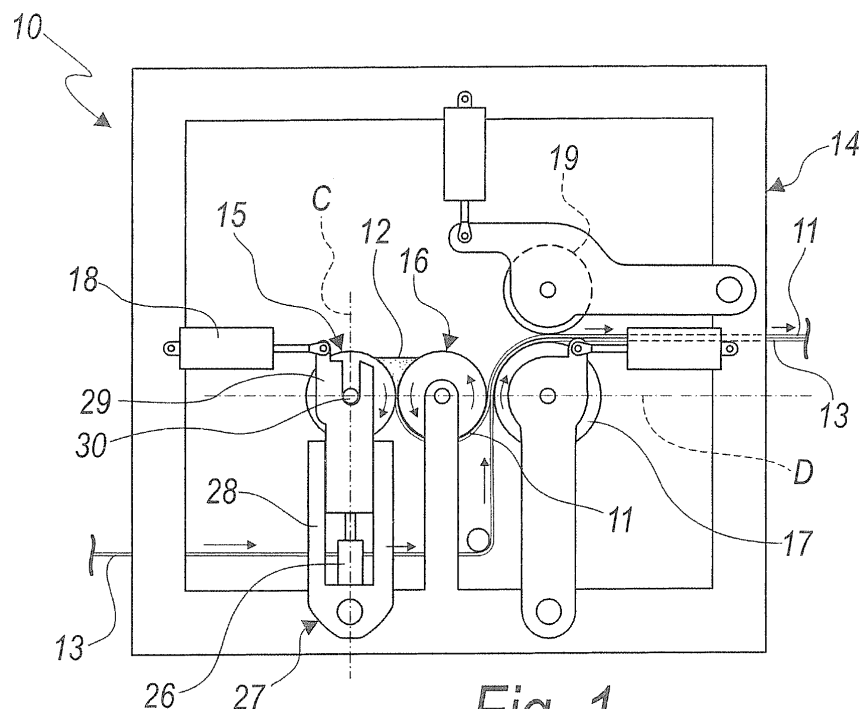


Fig. 1

Description

[0001] The present invention relates to a device for spreading adhesive films on fabrics, membranes or the like.

[0002] Devices for spreading adhesive films on fabrics, membranes or the like are currently known which comprise a frame that supports:

- an adhesive dosage roller, which rotates about a first axis of rotation defined by its longitudinal axis,
- an adhesive spreading roller, which rotates about a second axis of rotation defined by its longitudinal axis,
- a roller for pressing the fabric, membrane or the like against the spreading roller in order to spread the film of adhesive,
- means for the mutually adjacent arrangement of the dosage roller against the spreading roller.

[0003] Generally, the dosage roller and the spreading roller have a length of 2-3 meters, while their diameter is approximately 260 mm.

[0004] The dosage roller and the spreading roller rotate in mutually opposite directions at different speeds: the dosage roller in fact rotates at a peripheral speed of approximately 0.5 m/min, while the spreading roller rotates faster, with a peripheral speed of approximately 20 m/min.

[0005] Such rollers are parallel and adjacent at a distance which, depending on the type of adhesive and on the thickness of the film to be obtained, varies between 1 and 20 hundredths of a millimeter.

[0006] Heated or cold liquid adhesive is distributed between them in a region that is substantially centered on their centerline and is delimited laterally by sealing spatulas.

[0007] Due to the mutual movement of the spreading roller and the dosage roller, the adhesive is calendered by them, forming a film that adheres to the spreading roller.

[0008] The dosage roller is adjacent to a side of the spreading roller, the presser roller being adjacent to its opposite side.

[0009] The fabric to be processed is calendered between the spreading roller and the presser roller so that the spreading roller spreads by calendering on one of its faces a film of the adhesive that it carries.

[0010] One drawback of this type of device is that the adhesive that is forced between the spreading roller and the dosage roller by their mutually opposite rotation tends to divaricate them, causing a deformation thereof which, at their centerline, can have a deflection of approximately 2-4 hundredths of a millimeter.

[0011] This deformation therefore defines, at the centerline region of the dosage and spreading rollers, a region between them for the facilitated passage of the adhesive, and in this manner the film of adhesive obtained

by calendering of the adhesive between the dosage roller and the spreading roller and subsequently distributed on the fabric is uneven, having a greater thickness in its central region, which corresponds to the centerline region of the dosage and spreading rollers.

[0012] The aim of the present invention is to provide a device for spreading adhesive film on fabrics, membranes or the like that obviates the above-mentioned drawback, allowing to obtain a film of adhesive that is distributed uniformly over the entire region of the fabric that it affects.

[0013] Within this aim, an object of the invention is to provide a spreading device that can be adjusted depending on the type of adhesive to be distributed in film on a fabric or on a membrane being processed.

[0014] Another object of the invention is to provide a spreading device that is structurally simple and easy to use and can be manufactured with low costs.

[0015] This aim and these and other objects, which will become better apparent hereinafter, are achieved by a device for spreading adhesive films on fabrics, membranes or the like, which comprises a frame that supports

- an adhesive dosage roller, which can rotate about a first rotation axis, defined by its longitudinal axis,
- an adhesive spreading roller, which can rotate about a second rotation axis, defined by its longitudinal axis,
- a roller for pressing a fabric, membrane or the like against said spreading roller to spread it with a film of said adhesive,
- means for the mutually adjacent arrangement of said dosage roller against said spreading roller,

characterized in that it comprises means for the mutual inclination of said dosage roller with respect to said spreading roller which can be actuated by actuation means in order to pass from a first configuration, in which said first axis of rotation is parallel to said second axis of rotation, to second configurations, in which said first axis of rotation and said second axis of rotation are mutually oblique, and vice versa.

[0016] Further characteristics and advantages of the invention will become better apparent from the following detailed description of two preferred but not exclusive embodiments of the spreading device according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a side elevation view of a spreading device according to the invention;

Figure 2 is a diagram of a detail of the spreading device according to the invention in an operating configuration;

Figure 3 is an enlarged-scale side elevation view of a detail of an alternative embodiment of the spreading device according to the invention.

[0017] It is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0018] With reference to the figures, the reference numeral 10 generally designates a device for spreading films 11 of adhesive 12 on fabrics 13, membranes or the like, which comprises a frame 14 that supports:

- a roller 15 for dosing the adhesive 12, which can rotate about a first axis of rotation A defined by its longitudinal axis,
- a roller 16 for spreading the adhesive 12, which can rotate about a second axis of rotation B that is defined by its longitudinal axis,
- a roller 17 for pressing the fabric 13, membrane or the like against the spreading roller 16 to spread it with a film 11 of adhesive 12,
- means 18 for mutually adjacent arrangement, which conveniently comprise linear actuators that are designed to arrange the dosage roller 15 and the spreading roller 16 mutually adjacent.

[0019] Conveniently, the spreading device 10 further comprises a counterpressure roller 19 for mating the film 11 deposited on the fabric 13 by the spreading roller 16.

[0020] The counterpressure roller 19 is arranged adjacent to the presser roller 17 to calender the fabric 13 spread with the film 11.

[0021] The spreading device 10 according to the invention further comprises means for mutual inclination 20, which are adapted to incline with respect to each other the dosage roller 15 and the spreading roller 16.

[0022] The means 20 for mutual inclination can be actuated by actuation means in order to pass

- from a first configuration, in which the first axis A is parallel to the second axis B,
- to second configurations, in which the first axis A and the second axis B of rotation are mutually oblique,
- and vice versa.

[0023] Advantageously, the means for mutual inclination 20 comprise first means 21 for moving a first end 22 of the dosage roller 15 along a direction C that is substantially perpendicular to a reference plane D that is formed by the plane of arrangement shared by the first axis of rotation A and by the second axis of rotation B, in the first configuration.

[0024] Conveniently, the means for mutual inclination 20 comprise, together with, or as an alternative to, the first movement means 21, second means 23 for moving a first end 24 of the spreading roller 16 along the direction C that is substantially perpendicular to the reference plane D.

[0025] Of course, the first end 22 of the dosage roller 15 is the end that lies opposite the first end 24 of the spreading roller 16, thus a second end 25 of the dosage roller 15 that lies opposite the first end 22 is adjacent to

the first end 24 of the spreading roller 16.

[0026] Thus, once the means for mutual inclination 20 of the dosage roller 15 and/or of the spreading roller 16 are activated, the respective first axis A and second axis B of rotation are mutually inclined in an X-shaped configuration.

[0027] Preferably, the mutual inclination means 20 comprise linear actuators 26 and extensible brackets 27, which are composed of

- a guide 28 that is articulated to the frame 14,
- a fork-like slider 29 for supporting rotatably a hub 30 for supporting a roller that can be inclined and is selected between the dosage roller 15 and the spreading roller 16.

[0028] The fork-like slider 29 is coupled slidingly with the articulated guide 28 and at least one of the linear actuators 26 is connected to the articulated guide 28 and to the fork-like slider 29 for the movement of the latter along the direction C, substantially at right angles to the reference plane D.

[0029] Moreover, the mutual inclination means 20 conveniently comprise means for mating the presser roller 17 with the spreading roller 16 which are designed to maintain their parallel arrangement during the inclination of the spreading roller 16.

[0030] With reference to Figure 3, in an alternative embodiment of the spreading device 100 according to the invention the presser roller 117 rotates in the same direction as the spreading roller 116.

[0031] The fabric 113 is guided by a guiding roller 119 so as to partially wrap around the presser roller 117, which drives it between itself and the spreading roller 116 to receive the film 111 of adhesive 112 from it.

[0032] The operation of the spreading device 10 according to the invention is as follows.

[0033] Depending on the type of adhesive 12 to be distributed in film form 11 on the fabric 13 to be processed, the actuation means are preset to define a relative inclination of the first axis of rotation A of the dosage roller 15 with respect to the second axis of rotation B of the spreading roller 16; in this manner, if no adhesive is distributed between the dosage roller 15 and the spreading roller 16 their mutual distance increases as one moves away from their centerline, due to their mutual inclination.

[0034] Vice versa, when adhesive to be calendered is distributed between them, such adhesive, by interposing itself by being entrained by their mutual rotation, causes a divaricating deformation thereof that substantially makes their mutual distance uniform over the entire region affected by the distribution of adhesive.

[0035] Thus, the film 11 provided by the calendering of the adhesive 12 between the dosage roller 15 and the spreading roller 16 is substantially uniform.

[0036] In alternative embodiments, all of which are within the scope of the appended claims, it is possible to provide means for sensing the deformation of the spread-

ing roller 16 and/or of the dosage roller 15, the actuation means adjusting automatically, on the basis of these sensings, the mutual inclination of the first axis of rotation A and of the second axis of rotation B.

[0037] In practice it has been found that the invention achieves the proposed aim and objects, by providing a device for spreading adhesive film on fabrics, membranes or the like that allows to obtain a film of adhesive that is distributed uniformly over the entire region of fabric that it affects.

[0038] The distance between the spreading roller and the dosage roller is in fact kept constant, substantially over their entire region affected by the adhesive, by combining the divarication that increases toward their centerline, due to the action of the calendared adhesive, with the decreasing spacing toward their centerline region, which is forced by the mutual inclination of the dosage and spreading rollers.

[0039] Further, a spreading device can be adjusted according to the type of adhesive to be distributed in film form onto a fabric or membrane being processed.

[0040] The invention thus conceived is susceptible of numerous modifications and variations, all which are within the scope of the appended claims; all the details may further be replaced with other technically equivalent elements.

[0041] In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to requirements and to the state of the art.

[0042] The disclosures in Italian Patent Application No. PD2008A000108 from which this application claims priority are incorporated herein by reference.

[0043] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A device (10, 100) for spreading films (11, 111) of adhesive (12, 112) on fabrics (13, 113), membranes or the like, comprising a frame (14) that supports

- a roller (15) for dosing the adhesive (12), which can rotate about a first rotation axis (A), defined by its longitudinal axis,
- a roller (16, 116) for spreading the adhesive (12), which can rotate about a second rotation axis (B), defined by its longitudinal axis,
- a roller (17, 117) for pressing the fabric (13, 113), membrane or the like against said spreading roller (16, 116) to spread it with a film (11) of said adhesive (12),
- means (18) for the mutually adjacent arrange-

ment of said dosage roller (15) against said spreading roller (16, 116),

characterized in that it comprises means (20) for the mutual inclination of said dosage roller (15) with respect to said spreading roller (16, 116), which can be actuated by actuation means in order to pass from a first configuration, in which said first axis of rotation (A) is parallel to said second axis of rotation (B), to second configurations, in which said first axis of rotation (A) and said second axis of rotation (B) are mutually oblique, and vice versa.

2. The spreading device according to claim 1, **characterized in that** said means (20) for mutual inclination comprise first means (21) for moving a first end (22) of said dosage roller (15) along a direction (C) that is substantially perpendicular to a reference plane (D) defined by the plane of arrangement shared by said first axis (A) and said second axis (B) in said first configuration.

3. The spreading device according to claim 1, **characterized in that** said means (20) for mutual inclination comprise second means (23) for moving a first end (24) of said spreading roller (16, 116) along said direction (C) that is substantially perpendicular to said reference plane (D).

4. The spreading device according to one or more of the preceding claims, **characterized in that** said first end (22) lies opposite said first end (24), a second end (25) of said dosage roller (15), which lies opposite said first end (22), being adjacent to said first end (24) of said spreading roller (16, 116).

5. The spreading device according to one or more of the preceding claims, **characterized in that** said means (20) for mutual inclination comprise linear actuators (26).

6. The spreading device according to one or more of the preceding claims, **characterized in that** said means (20) for mutual inclination comprise extensible brackets (27), which are composed of

- a guide (28) that is articulated to said frame (14),
- a fork-like slider (29), for supporting rotatably a supporting hub (30) for a roller that can be inclined and is chosen between said dosage roller (15) and said spreading roller (16), said fork-like slider (29) being mated slidably with said articulated guide (28),
- at least one of said linear actuators (26), connected to said articulated guide (28) and to said fork-like slider (29) for the movement of the latter along said direction (C) that is substantially per-

pendicular to said reference plane (D).

7. The spreading device according to one or more of the preceding claims, **characterized in that** said mutual inclination means (20) comprise means for mating said presser roller (17, 117) to said spreading roller (16, 116), which are designed to maintain their parallel arrangement during the inclination of said spreading roller (16, 116).
8. The spreading device according to one or more of the preceding claims, **characterized in that** said presser roller (117) rotates in the same direction as the spreading roller (116).
9. The spreading device according to one or more of the preceding claims, **characterized in that** it comprises a guiding roller (119) for said fabric (113) which is adjacent to said presser roller (117), said fabric (113) being partially wrapped around said presser roller (117) which is designed to drive said fabric (113) between itself and said spreading roller (116) to receive said film (111) of adhesive (112) from it.

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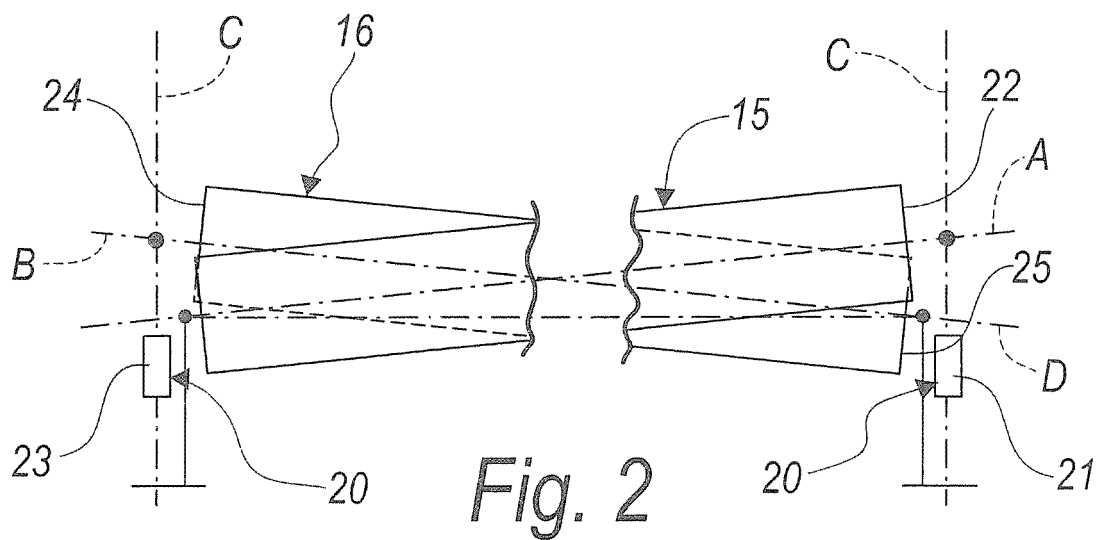
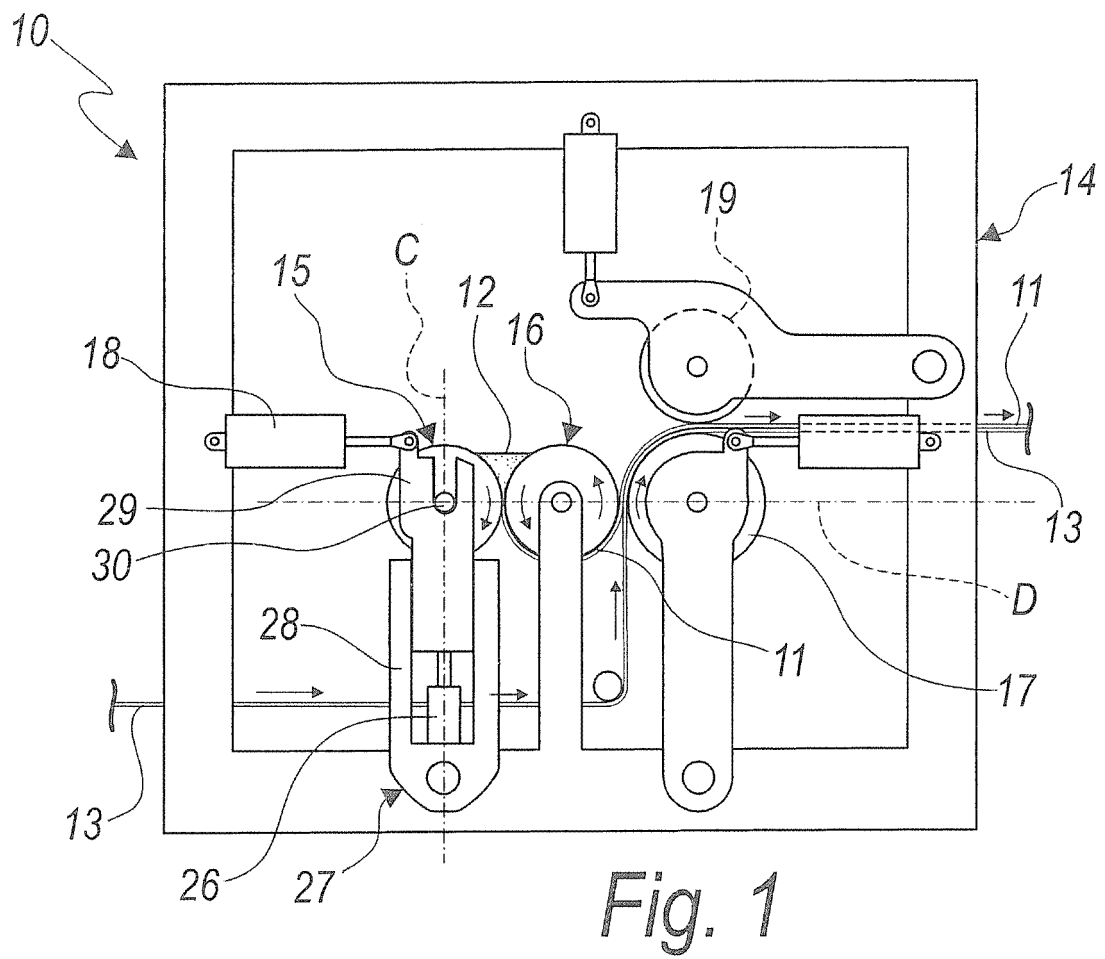
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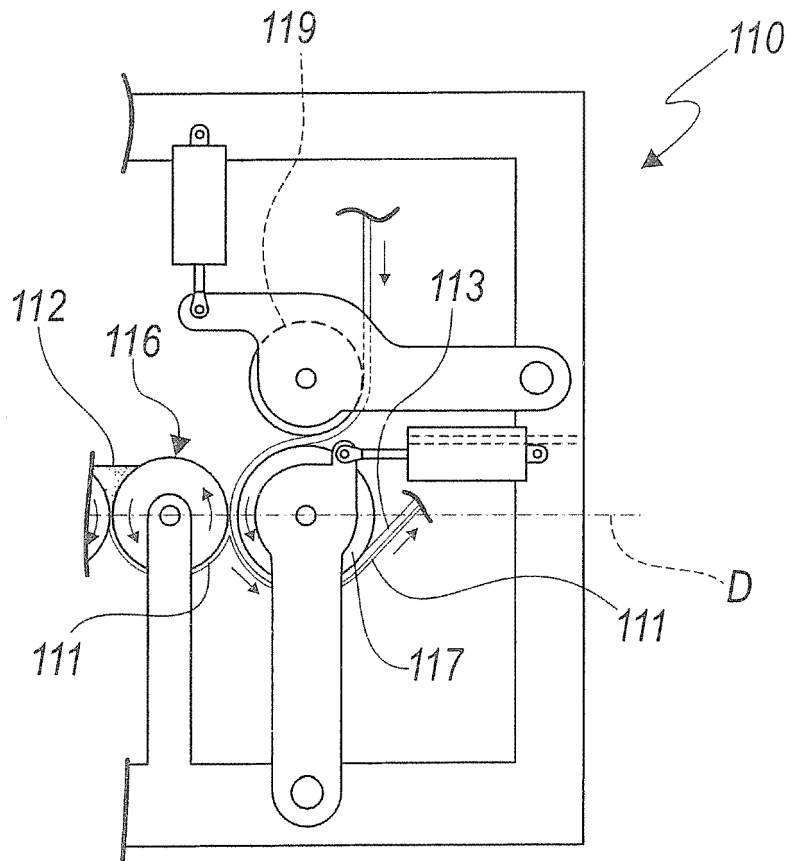


Fig. 3



EUROPEAN SEARCH REPORT

Application Number
EP 09 15 7577

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Place of search Munich		Date of completion of the search 3 June 2009	Examiner Pöll, Andreas
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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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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