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(54) **ABSORBENT PAPER PRODUCT WITH MULTIPLE LAYERS AND PRODUCTION PROCESS**

(57) A multiply absorbent paper product consisting of three or four plies of absorbent paper, wherein the two outer plies (1, 2) are flat and the central ply or plies (3),

placed between these two, are textured. A process for manufacturing said products involves the individual processing of each ply constituting the product.

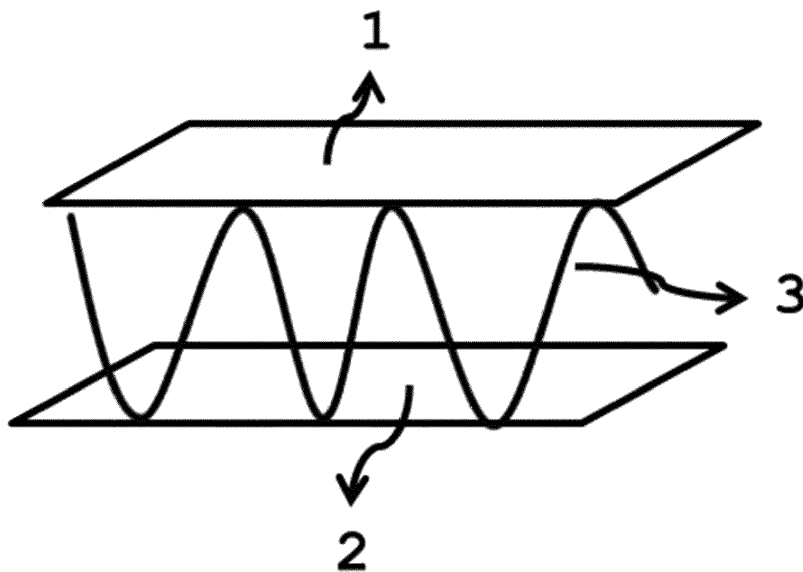


FIG. 1

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Description

Field of the Invention

[0001] The present invention relates to multiply absorbent paper products, and to the method for producing the same, for application in sanitary and household uses, more explicitly in sanitary papers, but as well in hand towels, towels, napkins, tissues and facials, that is, in the products called "tissue".

Background of the Invention

[0002] Domestic paper products, more particularly toilet papers, are currently made up of two, three or even four plies of paper. For example:

- the patent US6746558B2 discloses a multiply product having a specific grammage and consisting of 3 layers or plies of paper, one outer and one lower, which are textured with predetermined protruding patterns, and a central ply, not textured. The process for producing said product comprises embossing a first outer ply in an embossing roll, overlapping a central ply at the protuberances of said first textured outer ply and embossing a second outer ply in an embossing roll. Then all the plies are joined, by nesting: the first textured outer ply, coupled with the central ply, is joined to the second textured outer ply through a marrying roll and applying sufficient pressure for this purpose.
- the EP0564319A1 describes a product with 3 or 4 plies, all of which are textured. To obtain it, each ply is individually embossed, further occurring a first assembly of two plies and the resulting set is thereafter joined to another ply, also textured. If there are 4 plies in the overall product, the plies are joined two by two, and in the end, the two sets formed by two plies each are joined together to form the final product. There is a predetermined relationship between the embossing pattern of the different plies, regarding embossments and spacing, which will then support the process of joining the different plies.
- in the patent US6733866B2 the product consists of 3 plies of paper, each of which is textured. The patterns of the different plies defined in the invention are such that the final set contains a random array of patterns. Regarding the process, each ply is embossed separately, and the plies are joined at the same time. There is also the possibility of first joining two plies (the upper and the middle), and then the whole of the latter joins with the third ply (the lower one in the final product).
- in the patent EP2353859A1 the product consists of 3 plies, all of which are textured. The process of pro-

ducing the described product consists in embossing one ply individually which is then joined with a central ply, and then this set is embossed a second time. The result set of plies is then joined to a third ply, previously and independently textured, in a marrying roll.

[0003] The present invention aims at creating an advance in the prior art by providing a solution for multiply absorbent products of superior quality in terms of surface smoothness, thickness and flexible robust structure, which are also manufactured through a manufacturing process which allows a reduction on the use of the embossing rolls, and a less pressure is needed to be applied, thus prolonging the working life of the equipment involved.

Brief Description of the Drawings

[0004]

- Figure 1 shows a cross-sectional view of a multiply product according to the definitions described in this invention.
- Figure 2 shows the production process of the products described in this invention.

Detailed Description of the Invention

[0005] The present invention concerns superior quality multiply absorbent products, through greater hand-feel, greater thickness and a more flexible robust structure. These characteristics are achieved by structuring three plies, two of these plies (upper (1) and lower (2)) being flat and the central ply (3) placed between the two, previously textured. Additionally, to this absorbent product it may also be added water or an aqueous solution containing softeners, essences, lotions, absorption promoters and / or strength improvers.

[0006] The manufacturing process described furthermore allows a reduction of the use of the embossing rolls coupled with a decrease on the amount of pressure needed to be applied, thus extending the working life of the equipment involved.

Example

[0007] In accordance with the preferred embodiment of the present invention, each ply constituting the product is processed individually. The upper ply (1) is kept flat while the central ply (3) in the product is pre-textured (4) prior to entering the embossing and winding process. These two plies are joined prior to their passage by an upper auxiliary steel roll (5), from which are then transferred to the laminating glue cliché roll (6).

[0008] In another preferred embodiment of the present invention, by the effect of a slight pressure between the

laminating glue cliché roll (6) and the embossing upper roll (7) the upper ply may become textured.

[0009] The lower ply (2), which remains flat, is finally joined with the upper and central ply set in the last roll of the transformation process, the marrying roll (8).

[0010] The upper ply (9), whether it remains flat or textured in the final product, undergoes an additive addition process (10) prior to entering the embossing and winding process, with an aqueous solution characterized by the additives described above.

[0011] The central ply is subjected to an additive addition process (11) before entering the embossing and winding process with an aqueous solution characterized by the additives described above. In another preferred embodiment of the invention to this central ply only water (11) is added. These possibilities apply whether the upper ply in the final product remains flat or textured.

[0012] In another preferred embodiment of the invention, it is added an extra central ply (12), similar to the one mentioned above (3), in terms of additives and texturing, which is also attached to the upper ply (1) at the embossing and winding process.

Claims

1. A multiply absorbent paper product **characterized by** three plies in which:

- the upper (1) and lower (2) plies are flat;
- the central ply is textured (3).

2. A multiply absorbent paper product according to claim 1 **characterized in that** said upper ply contains an aqueous solution of additives.

3. A multiply absorbent paper product according to claim 1 **characterized in that** said central ply contains an aqueous solution of additives.

4. A multiply absorbent paper product according to claim 1 **characterized in that** said central ply contains water.

5. A multiply absorbent paper product according to claim 1 **characterized by** containing an additional textured central ply (12).

6. A multiply absorbent paper product according to claims 2 and 3 **characterized in that** said aqueous solution of additives comprises a compound selected from the group consisting of softeners, essences, lotions, absorption promoters, or strength improvers, and any combinations thereof.

7. Production process of multiply absorbent paper products **characterized by** the following steps:

- the central ply (3) of the final product is pre-textured prior to entering the embossing and winding process;

- the flat upper ply (1) joins the central ply prior to its passing by an upper auxiliary roll (5);

- the set of these two plies are then led to a laminating glue cliché roll (6);

- the flat lower ply (2) is joined to the upper and central plies set in the marrying roll (8).

8. Production process according to claim 7 **characterized in that** upper ply (1) joins a second central ply (12).

9. Production process according to claim 8 **characterized in that** said second central ply is pre-textured and additives are added to it before entering the embossing and winding process.

10. A multiply absorbent paper product, obtainable by the process described in claims 7 to 9, **characterized by** an upper ply being textured after passing between the laminating glue cliché roll (6) and the upper embossing roll (7).

11. A multiply absorbent paper product according to claim 10 **characterized in that** said upper ply contains an aqueous solution of additives.

12. A multiply absorbent paper product according to claim 10 **characterized in that** said central ply contains water.

13. A multiply absorbent paper product according to claim 10 **characterized in that** said central ply contains an aqueous solution of additives.

14. A multiply absorbent paper product according to claims 11 and 13 **characterized in that** said aqueous solution of additives comprises a compound selected from the group consisting of softeners, essences, lotions, absorption promoters, or strength improvers, and any combinations thereof.

15. The use of multiply absorbent paper products of claims 1 to 6 and 10 to 14 as toilet paper, hand towels, towels, napkins, tissues and facials.

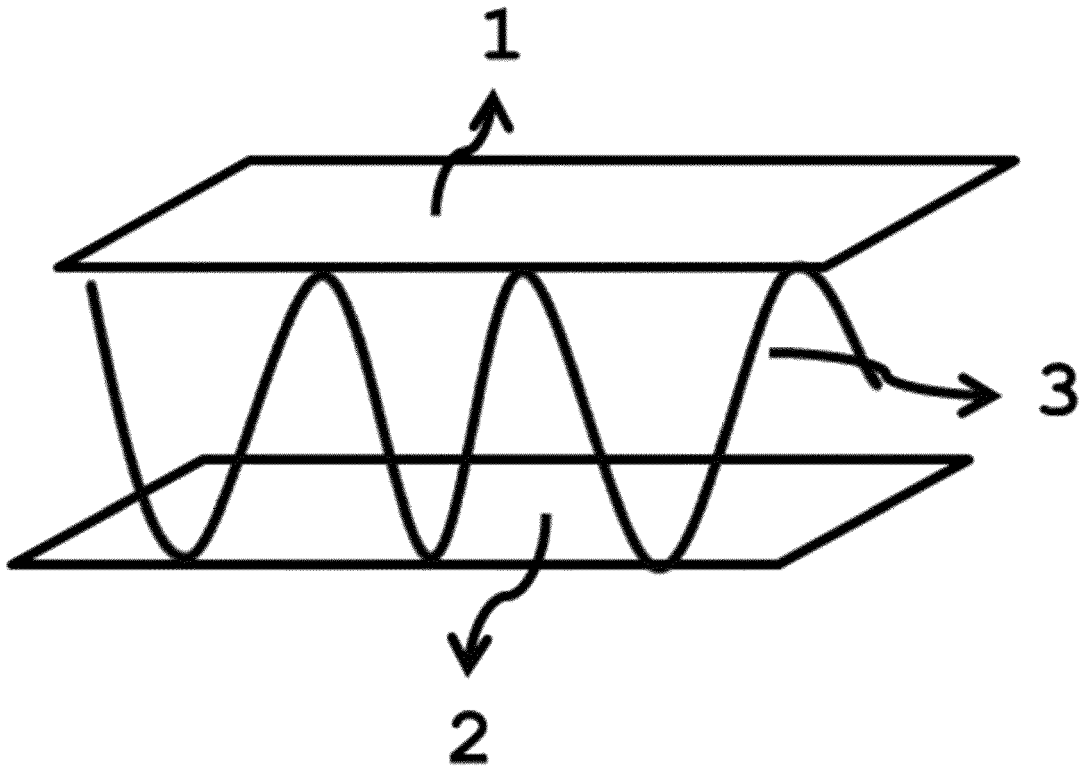


FIG. 1

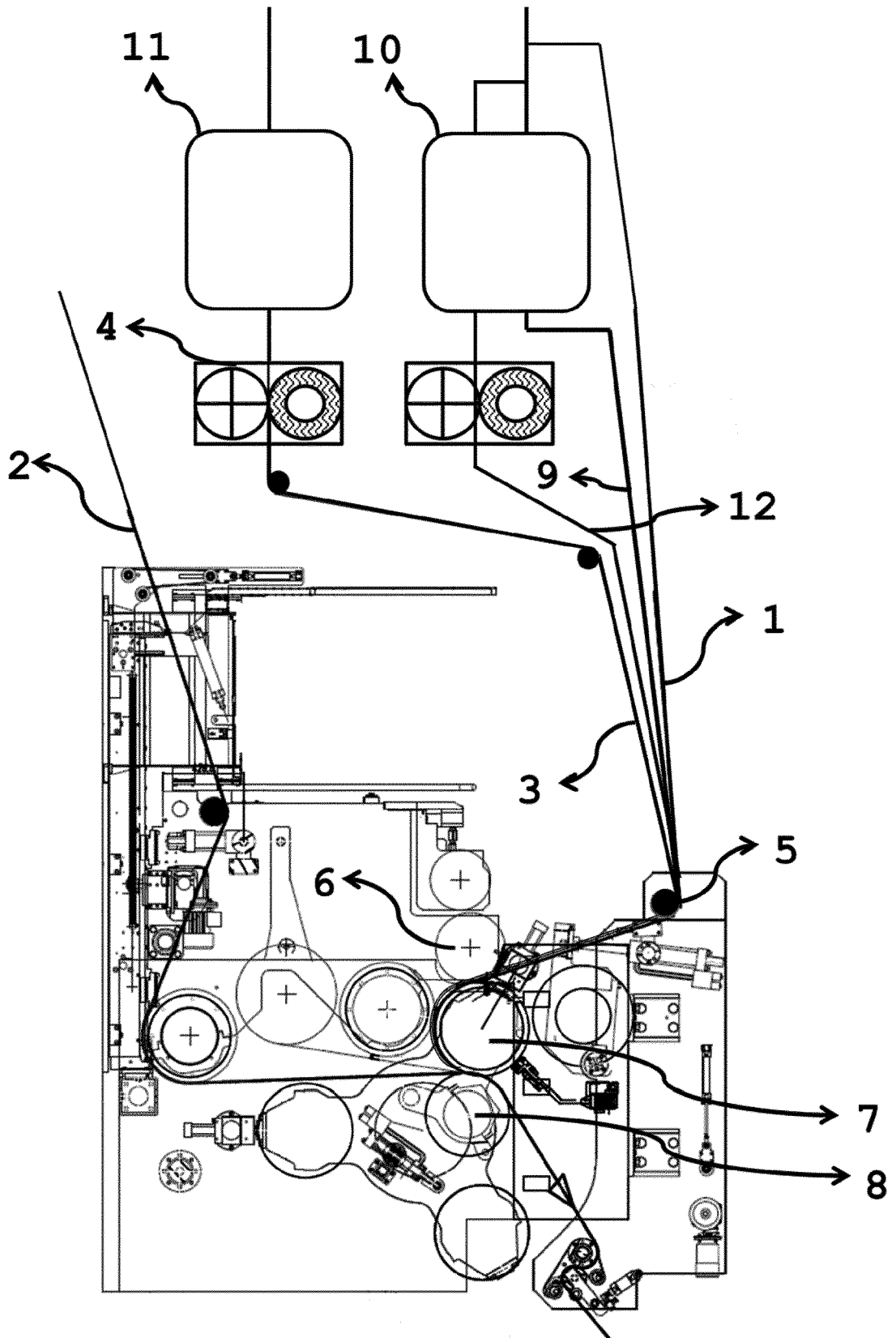


FIG. 2



EUROPEAN SEARCH REPORT

Application Number
EP 18 20 5555

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 21 February 2019	Examiner Sundqvist, Stefan
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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