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(71) Applicant: **Gambini, Giovanni**
56100 Pisa (IT)

(72) Inventor: **Gambini, Giovanni**
56100 Pisa (IT)

(74) Representative: **De Gregori, Antonella et al**
Ing. Barzano' & Zanardo Milano S.p.A.
Via Borgonuovo 10
20121 Milano (IT)

(54) **Multilayer toilet paper**

(57) Multilayer toilet paper (10) comprising a first outer layer (20) a second inner layer (30) and at least one middle layer (40) in-between, wherein the at least one middle layer (40) is a waved layer.

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Description

[0001] The present invention refers to a multilayer toilet paper which can be used as toilet paper and/or as a paper for household use.

[0002] The present invention refers in particular to a toilet paper with three or more plies combined together to obtain a multilayer toilet paper.

[0003] Recently, it is even more required to have even softer and more tender toilet papers and, at the same time, provided with enough mechanical strength.

[0004] In recent times, there are methods for realizing multilayer toilet papers through hot-air drying means which however have the disadvantage of a high cost of production.

[0005] An objective of the present invention is to realize a multilayer toilet paper with a high softness and a good mechanical resistance.

[0006] Another objective of the present invention is that of realizing a low-cost multilayer toilet paper.

[0007] A further objective of the present invention is to realize a multilayer toilet paper with a high softness and good mechanical strength and at the same time low-cost.

[0008] The above objectives are achieved, according to the present invention, realizing a multilayer toilet paper as disclosed in claim 1.

[0009] Further characteristics of the invention are clearly shown in the successive claims.

[0010] The characteristics and the advantages of a multilayer toilet paper, according to the present invention, will appear more evident from the following illustrative and non-limiting description referring to the schematic drawings, in which:

Figures 1a-1d are schematic views of a multilayer paper according to a first embodiment of the invention in which figure 1a is a longitudinal section of a three-ply product and figures 1b-1d are plan views from above of the outer ply, the middle ply and the inner ply;

Figures 2a-2d are schematic views of a multilayer paper according to a second embodiment of the invention in which figure 2a is a longitudinal section of a three-ply product and figures 2b-2d are plan views from above of the outer ply, the middle ply and the inner ply;

Figures 3a-3d are schematic views of a multilayer paper according to a third embodiment of the invention, in which figure 3a is a longitudinal section view of a three-ply product and figures 3b-3d are plan views from above of the outer ply, the middle ply and the inner ply.

Figure 4 is a merely schematic view of a longitudinal section of a three-ply product according to a fourth embodiment of the present invention.

[0011] With reference to the figures 1a-1d, a multilayer toilet paper is shown, namely with more than one ply (at

least three) having a high thickness according to a first embodiment of the invention, wholly indicated with 10.

[0012] Said multilayer toilet paper 10 has a first outer layer or ply 20, a second inner layer or ply 30 and at least one middle layer or ply 40 wave-shaped.

[0013] Said at least one middle layer 40 is preferably waved along one preferred direction possibly correspondent with a longitudinal direction 50.

[0014] Preferably, said at least one middle layer 40 has a uniform waved section.

[0015] That is to increase the thickness and the volume of the multilayer toilet paper 10 in a way that it results very soft.

[0016] Advantageously in this way it is obtained a multilayer toilet paper 10 low-cost and simple to realize.

[0017] Preferably, said preferred direction not necessary corresponds with the longitudinal direction 50 of the extension of the multilayer toilet paper 10: in fact, it could be also in a leaned position with respect to the longitudinal direction 50, as shown in figure 3c.

[0018] Said at least one middle layer 40 shows in section a wave or waves-direction preferably having the same heights, that is to obtain a multilayer toilet paper 10, having a predetermined thickness overall on the basis of the elevation of the waves of said at least one middle layer 40.

[0019] Each wave has preferably an uniform sequence, as those shown in the various illustrative figures, or it could be a wave with both a variable shape and elevation steps (not shown).

[0020] Preferably said at least one middle layer 40 shows in section a wave periodic sequence which is substantially sinusoidal or cosinusoidal or square or triangular or trapezoidal as shown in figure 4, or it can show a subsequent combination of them.

[0021] Preferably said first outer layer 20 and/or said second inner layer 30 have a smooth surface, as shown in figures 1a, 3a and 4.

[0022] Figures 2a-2d are schematic views of a multilayer paper according to a second embodiment of the invention.

[0023] Also in this case, a multilayer toilet paper is shown, having three plies or layers where, for the sake of easiness, the same reference numerals have been used referring to elements which have the same function.

[0024] Therefore, said multilayer toilet paper 10 has a first outer layer or ply 20, a second inner layer or ply 30 and at least one middle layer or ply 40, which is wave-shaped.

[0025] Moreover, in this case, the first outer layer 20 and the second inner layer 30 have an embossed surface comprising a plurality of base projections 21 or differently shaped or with a broaden size 22.

[0026] The density of the base projections 21 on the embossed surface shows at least 20 projections/cm² which can be eventually interspaced by the above projections of different shape 22 with various drawings, as pyramids, flowers, etc.

[0027] Moreover, the outer and inner layers 20 and 30 can have different numbers of projections between each other, as for instance 40 projections/cm² on one side and 25 projections/cm² on the other side.

[0028] Such projections included in the embossed surface can be realized with different heights between each other in a way to confer to the final product a diversified volume along its extension with variable softness.

[0029] Figures 3a-3d are schematic views of a multilayer paper according to a third embodiment of the present invention.

[0030] Also in this case, a multilayer toilet paper is shown, having three layers or plies where, for the sake of easiness, the same reference numerals are used which have the same function.

[0031] Therefore, said multilayer toilet paper 10 has a first outer layer or ply 20, a second inner layer or ply 30 and at least one middle layer or ply 40 differently wave-shaped.

[0032] The first outer layer 20 has an embossed surface comprising a plurality of base projections 21 differently shaped and/or of a broader size 22.

[0033] The density of the base projections 21 on the embossed surface is at least 20 projections/cm² which can be eventually interspaced by the above projections of different shape 22 with various drawings, such as pyramids, flowers, etc.

[0034] The middle layer 40 is waved in a way to extend along a leaned direction with respect to the longitudinal direction 50, as well evidenced in figure 3c.

[0035] The inner layer 30 is, in this particular case, but only for explicative purpose, of the smooth kind.

[0036] In all these examples the link with the layers or plies is realized thanks to the supply of adhesive, in the scheme with reference 60.

[0037] The adhesive 60 is placed in correspondence with a plurality of crests and valleys shown in section of the middle layer 40 in a way to connect said layer to both the outer layer 20 and inner layer 30.

[0038] In this way the multilayer toilet paper 10 will appear very soft in the transversal direction, maintaining moreover good mechanical characteristics along the longitudinal direction 50.

[0039] It will appear evident that the multilayer toilet paper realized according to the present invention achieves the objectives as above described.

[0040] The multilayer toilet paper as conceived in the present invention can be subjected to numerous modifications and variations, all comprised in the same inventive concept.

[0041] Moreover, the materials practically used, as well as size and components, can be whichever according to the technical requirements.

layer (20), a second inner layer (30) and at least one middle layer (40) in-between **characterized in that** said at least one middle layer (40) is a waved layer.

- 5 2. Multilayer toilet paper (10) according to claim 1, **characterized in that** said at least one middle layer (40) is waved along a preferred direction.
- 10 3. Multilayer toilet paper (10) according to claim 1, **characterized in that** said at least one middle layer (40) has an uniform waved section.
- 15 4. Multilayer toilet paper (10) according to claim 1, **characterized in that** said at least one middle layer (40) has in section a cyclic wave trend substantially sinusoidal or cosinusoidal or square or triangular or trapezoidal or a subsequent combination of them.
- 20 5. Multilayer toilet paper (10) according to one of the previous claims 2 to 4, **characterized in that** said at least one middle layer (40) has a waved section along a preferred direction correspondent with a longitudinal direction (50).
- 25 6. Multilayer toilet paper (10) according to one of the previous claims 2 to 4 **characterized in that** said at least one middle layer (40) has a waviness that develops along a leaning direction with respect to a longitudinal direction (50).
- 30 7. Multilayer toilet paper (10) according to claim 1 **characterized in that** said at least one first outer layer (20) and/or said second inner layer (30) have a smooth surface.
- 35 8. Multilayer toilet paper (10) according to claim 1, **characterized in that** said first outer layer (20) and/or said second inner layer (30) have an embossed surface comprising a plurality of projections (21,22).
- 40 9. Multilayer toilet paper (10) according to claim 7, **characterized in that** said embossed surface has at least 20 projections/cm².
- 45 10. Multilayer toilet paper (10) according to claim 7 or 8, **characterized in that** said embossed surface comprises a plurality of base projections (21) or of different shape and or broader size (22).
- 50
- 55

Claims

1. Multilayer toilet paper (10) comprising a first outer

Fig.1a

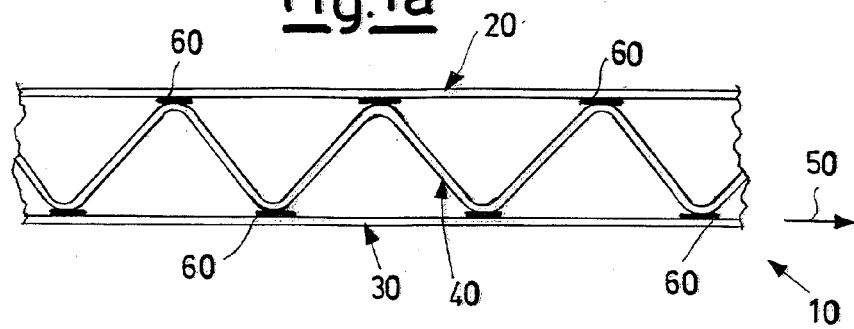


Fig.1b

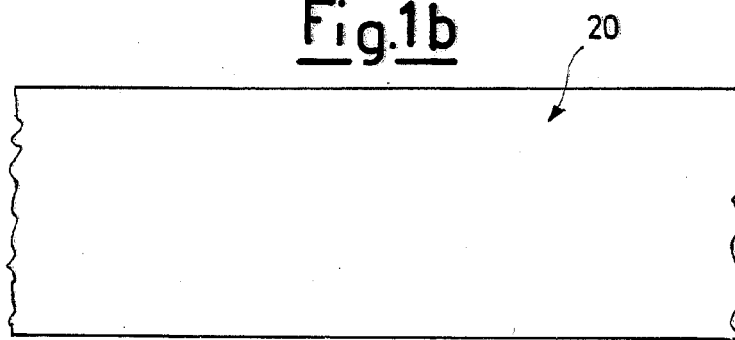


Fig.1c

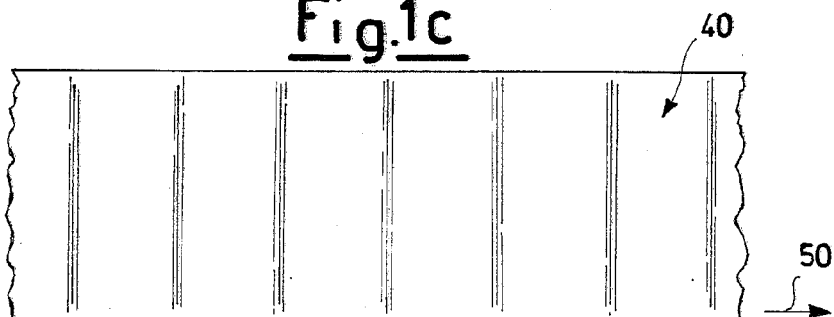
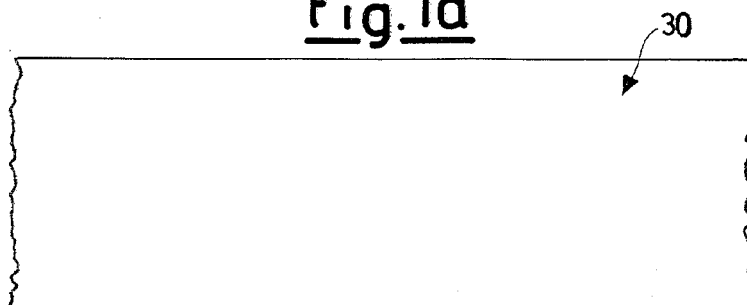
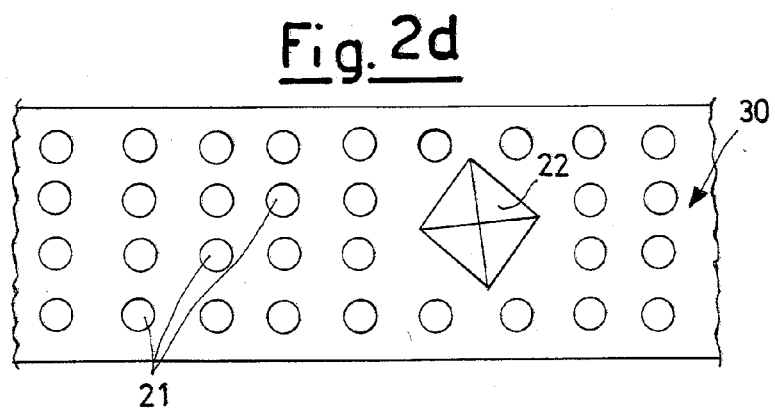
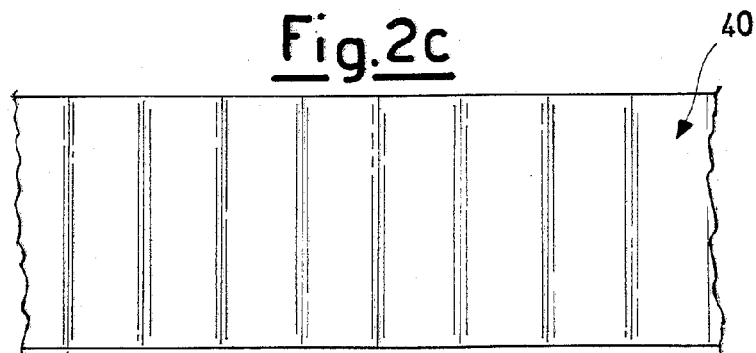
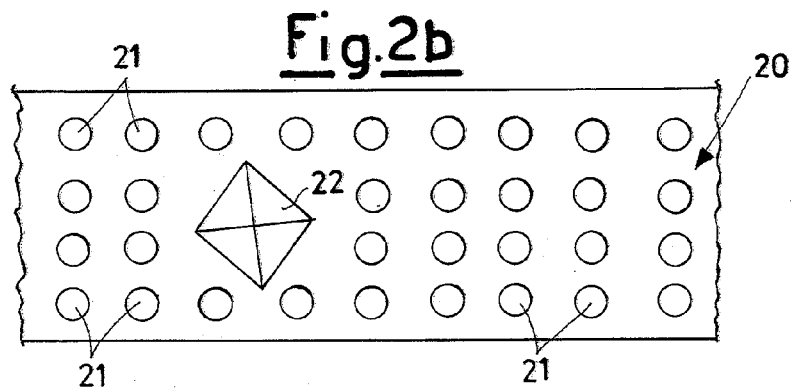
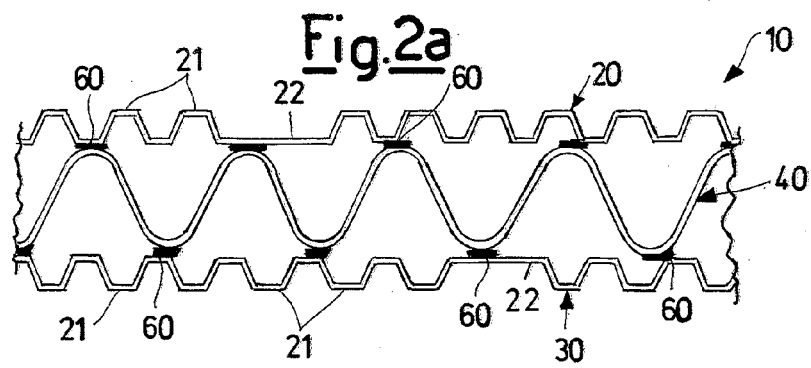


Fig.1d





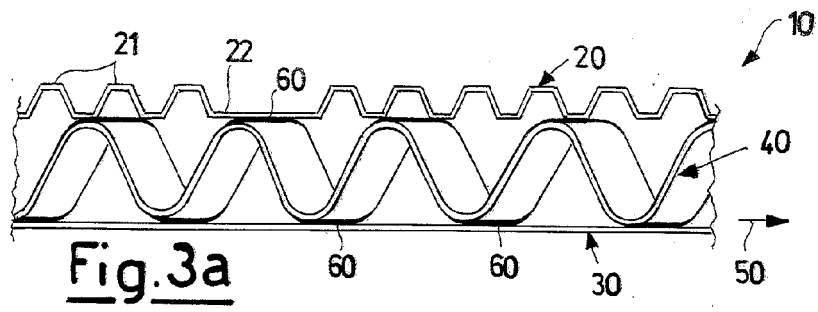


Fig. 3b

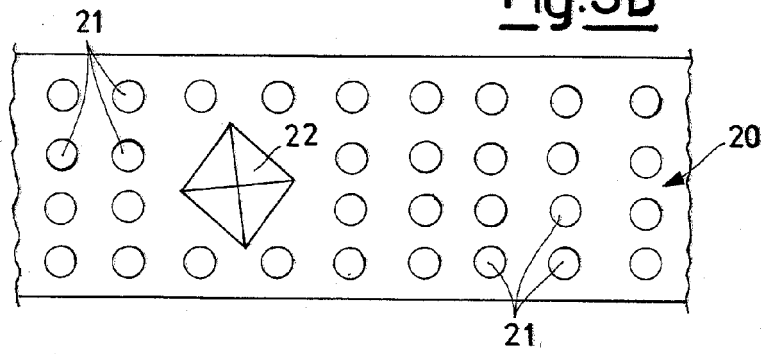


Fig. 3c

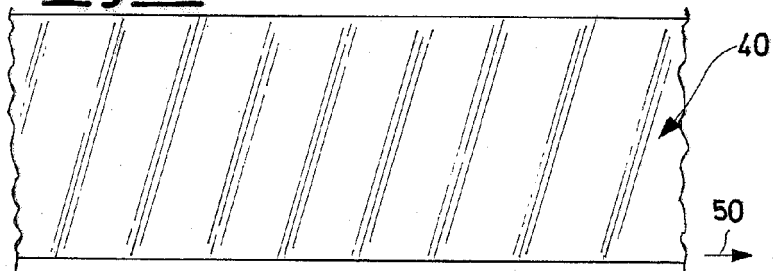


Fig. 3d

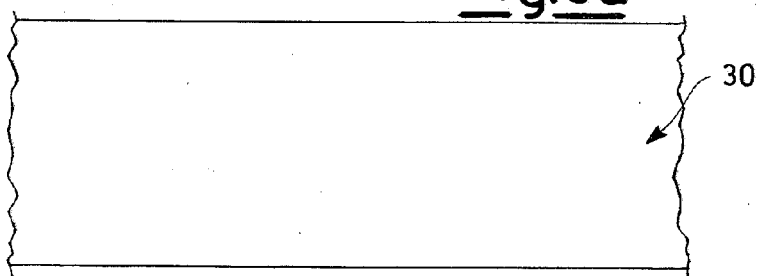
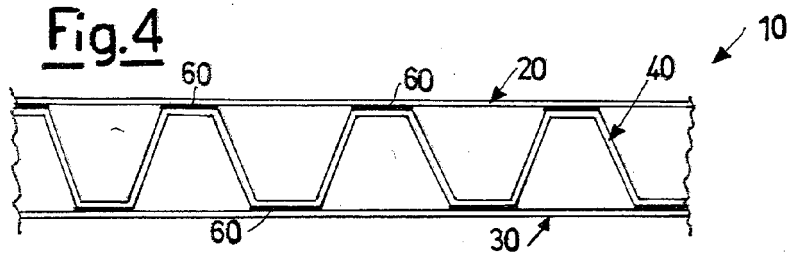


Fig. 4





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Application Number
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Place of search Munich		Date of completion of the search 20 June 2006	Examiner Karlsson, L
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