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(54) **FIBERGLASS WALL FINISHING SYSTEM**

(57) According to one embodiment, a wall finishing system is disclosed. The wall finishing system can include a substrate comprising fiberglass. The wall finishing system can also include a coating overlying the substrate. The coating can comprise a binder and a pigment. According to one embodiment, a method of making a wall finishing system is disclosed. The method can include providing a substrate comprising fiberglass. The method can further include depositing a coating overlying the substrate. The coating can comprise a binder and a pigment.

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Description

FIELD OF THE DISCLOSURE

[0001] The present disclosure relates to fiberglass wall finishing systems and methods of making the same.

BACKGROUND

[0002] Drywall finishing processes can be cumbersome and lengthy, requiring considerable drying times, restring productivity. Traditional finishing methods require prefill, taping, multiple topping, skim coat or texturization, priming, and painting steps. There is a need for improved finishing systems that can produced a finished drywall with less time and effort.

SUMMARY

[0003] According to one embodiment, a wall finishing system is disclosed. The wall finishing system can include a substrate comprising fiberglass. The wall finishing system can also include a coating overlying the substrate. The coating can comprise a binder and a pigment.

[0004] According to one embodiment, a method of making a wall finishing system is disclosed. The method can include providing a substrate comprising fiberglass. The method can further include depositing a coating overlying the substrate. The coating can comprise a binder and a pigment.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] The present disclosure may be better understood, and its numerous features and advantages made apparent to those skilled in the art by referencing the accompanying drawings.

FIG. 1 includes an example illustration of a wall finishing system.
FIG. 2 includes an example illustration of an opacity measurement system.

DETAILED DESCRIPTION

[0006] The following description in combination with the figures is provided to assist in understanding the teachings disclosed herein. The following discussion will focus on specific implementations and embodiments of the teachings. This focus is provided to assist in describing the teachings and should not be interpreted as a limitation on the scope or applicability of the teachings.

[0007] As used herein, the terms "comprises," "comprising," "includes," "including," "has," "having" or any other variation thereof, are intended to cover a non-exclusive inclusion. For example, a process, method, article, or apparatus that comprises a list of features is not necessarily limited only to those features but may include other features not expressly listed or inherent to such process, method, article, or apparatus.

[0008] As used herein, and unless expressly stated to the contrary, "or" refers to an inclusive-or and not to an exclusive-or. For example, a condition A or B is satisfied by any one of the following: A is true (or present) and B is false (or not present), A is false (or not present) and B is true (or present), and both A and B are true (or present).

[0009] Also, the use of "a" or "an" are employed to describe elements and components described herein. This is done merely for convenience and to give a general sense of the scope of the invention. This description should be read to include one or at least one and the singular also includes the plural unless it is obvious that it is meant otherwise.

[0010] The use of the word "about," "approximately," or "substantially" is intended to mean that a value of a parameter is close to a stated value or position. However, minor differences may prevent the values or positions from being exactly as stated. Thus, differences of up to ten percent (10%) for the value are reasonable differences from the ideal goal of exactly as described.

[0011] Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. The materials, methods, and examples are illustrative only and not intended to be limiting. To the extent not described herein, many details regarding specific materials and processing acts are conventional and may be found in textbooks and other sources within the construction products arts.

[0012] Various embodiments of the present disclosure will now be described, by way of example only, with reference to the accompanying drawings.

[0013] The present disclosure is concerned with wall finishing systems methods for making them. As such, a wall finishing system is disclosed. FIG. 1 includes an exemplary illustration of a wall finishing system 100. The wall finishing

system 100 can include a substrate 101 comprising fiberglass. The wall finishing system can also include a coating 105 overlying the substrate 101. The coating 105 can comprise a binder and a pigment.

[0014] In an embodiment, the substrate 101 can include particular materials that may facilitate improved performance and/or manufacturing of the wall finishing system. In an embodiment, the substrate may comprise or consist of fiberglass. In an embodiment, the substrate may include thermoplastic fibers, natural fibers (e.g. cellulosic fibers), or mineral fibers (e.g. glass). In an embodiment, the substrate may include a combination of glass fibers and thermoplastic fibers. The substrate may comprise woven fibers, knitted fibers, non-woven fibers, or a combination thereof.

[0015] In an embodiment, the substrate 101 can have a particular weight that may facilitate improved performance and/or manufacturing of the finishing system. In an embodiment the substrate can have a weight of at least 125 g/m^2. and not greater than 200 g/m^2.

[0016] In an embodiment, the substrate 101 can have a particular thickness that may facilitate improved performance and/or manufacturing of the finishing system. In an embodiment the substrate can have a thickness of 0.30mm to 0.40mm.

[0017] In an embodiment, the substrate 101 can have a particular opacity that may facilitate improved performance and/or manufacturing of the wall finishing system. In an embodiment the substrate can have a opacity of not greater than 96 lux or not greater than 90 lux or not greater than 86 lux. Lux can be measured according to the process decribed in the examples.

[0018] In an embodiment, the coating 105 can include a particular composition that may faciliate improved performance and/or manfuacturing of the wall finishing system. In an embodiment, the coating can include 40 wt.% to 70 wt.% water. In an embodiment, the coating can include 10 wt.% to 30 wt.% pigment. The pigment can be a white pigment. In an embodiment, the coating can include 0 to 3 wt. % of antifoaming agent. In an embodiment, the coating can include 0 to 2 wt. % of dispersant. In an embodiment, the coating can include 0 to 2 wt. % of thickener. In an embodiment, the coating can include 0 to 2 wt. % of additives. In an embodiment, the coating can include 0 to 4 wt. % of wetting agent.

[0019] In an embodiment, the binder can include a particular composition that may faciliate improved performance and/or manfuacturing of the wall finishing system. In an embodiment, the binder may comprise an acrylic, SBR, PVOH, PVAc, urea formaldehyde, phenol formaldehyde, melamine formaldehyde, themorplastics, or a combination thereof.

[0020] In an embodiment, the pigment can include a particular composition that may faciliate improved performance and/or manfuacturing of the wall finishing system. In an embodiment, the pigmint may comprise TiO_2, $CaCO_3$, or a combination thereof.

[0021] In an embodiment, the wall finishing system 100 can have a particular thickness that may facilitate improved performance and/or manufacturing of the finishing system. In an embodiment the wall finishing system can have a thickness of 0.40mm to 0.55mm.

[0022] In an embodiment, the wall finishing system 100 can have a particular weight that may facilitate improved performance and/or manufacturing of the finishing system. In an embodiment the substrate can have a weight of at least 186 g/m^2. and not greater than 300 g/m^2.

[0023] In an embodiment, the wall finishing system 100 can have a particular opacity that may facilitate improved performance and/or manufacturing of the finishing system. In an embodiment the wall finishing system can have an opacity of not greater than 55 lux or not greater than 50 lux or not greater than 45 lux.

[0024] In an embodiment, the coating 105 can have a patterned or decorative finish.

[0025] Wall finishing systems 100 described herein may be applied to wall substrates or surfaces such as drywall, plywood, oriented strand board (OSB), fiber-reinforced plastics (FRP), Medium-density fibreboard (MDF), and any other substrate used to close wall cavities.

[0026] In an embodiment, the wall finishing system 100 can include a functional backing 110, underlying the coated substrate 101. The functional backing may comprise an adhesive, such as a water-activated adhesive. The functional backing may have a roughened surface to enhance adhesion to wall substrates.

EMBODIMENTS

[0027] Embodiment 1. A wall finishing system comprising:

a substrate comprising fiberglass; and
a coating overlying the substrate, the coating comprising a binder and a pigment.

[0028] Embodiment 2. The wall finishing system of embodiment 1, wherein the substrate further comprises thermoplastic fibers, cellulosic fibers, or a combination thereof.

[0029] Embodiment 3. The wall finishing system of embodiment 1, wherein the substrate comprises woven or knitted fibers.

[0030] Embodiment 4. The wall finishing system of embodiment 1, wherein the substrate comprises non-woven fibers.

[0031] Embodiment 5. The wall finishing system of embodiment 1, wherein the substrate further comprises a weight of at

least 125 g/m^2 and not greater than 200 g/m^2.

[0032] Embodiment 6. The wall finishing system of embodiment 1, wherein the substrate further comprises a thickness of 0.30mm to 0.40mm.

[0033] Embodiment 7. The wall finishing system of embodiment 1, wherein the substrate further comprises an opacity of not greater than 96 lux or not greater than 90 lux or not greater than 86 lux.

[0034] Embodiment 8. The wall finishing system of embodiment 1, wherein the wall finishing system comprises a thickness of 0.40mm to 0.55mm.

[0035] Embodiment 9. The wall finishing system of embodiment 1, wherein the wall finishing system comprises an opacity of not greater than 55 lux or not greater than 50 lux or not greater than 45 lux.

[0036] Embodiment 10. The wall finishing system of embodiment 1, wherein the wall finishing system comprises a weight of at least 186 g/m^2 and not greater than 300 g/m^2.

[0037] Embodiment 11. The wall finishing system of embodiment 1, wherein the coating comprises 15 wt.% to 40 wt.% binder.

[0038] Embodiment 12. The wall finishing system of embodiment 1, wherein the binder comprises an acrylic, SBR, PVOH, PVAc, urea formaldehyde, phenol formaldehyde, melamine formaldehyde, or a combination thereof.

[0039] Embodiment 13. The wall finishing system of embodiment 1, wherein the coating comprises 10 wt.% to 30 wt.% pigment.

[0040] Embodiment 14. The wall finishing system of embodiment 1, wherein the pigment comprises white pigment.

[0041] Embodiment 15. The wall finishing system of embodiment 1, wherein the pigment comprises TiO_2, $CaCO_3$, or a combination thereof.

[0042] Embodiment 16. The wall finishing system of embodiment 1, wherein the coating comprises an antifoam agent.

[0043] Embodiment 17. The wall finishing system of embodiment 16, wherein the coating comprises 0 to 3 wt. % of antifoaming agent.

[0044] Embodiment 18. The wall finishing system of embodiment 1, wherein the coating comprises a dispersant.

[0045] Embodiment 19. The wall finishing system of embodiment 18, wherein the coating comprises 0 to 2 wt. % of dispersant.

[0046] Embodiment 20. The wall finishing system of embodiment 1, wherein the coating comprises a thickener.

[0047] Embodiment 21. The wall finishing system of embodiment 20, wherein the coating comprises 0 to 2 wt. % of thickener.

[0048] Embodiment 22. The wall finishing system of embodiment 1, wherein the coating comprises an additive.

[0049] Embodiment 23. The wall finishing system of embodiment 22, wherein the coating comprises 0 to 2 wt. % of additives .

[0050] Embodiment 24. The wall finishing system of embodiment 1, wherein the coating comprises a wetting agent.

[0051] Embodiment 25. The wall finishing system of embodiment 24, wherein the coating comprises 0 to 4 wt. % of wetting agent.

[0052] Embodiment 26. The wall finishing system of embodiment 1, wherein the coating comprises a decorative or patterned finish.

[0053] Embodiment 27. The wall finishing system of embodiment 1, further comprising a functional backing underlying the coating and the substrate.

[0054] Embodiment 28. The wall finishing system of embodiment 27, wherein the functional backing comprises an adhesive.

[0055] Embodiment 29. The wall finishing system of embodiment 27, wherein the functional backing comprises a roughened surface .

[0056] Embodiment 30. A method of preparing a wall finshing system comprising:

providing a substrate comprising a substrate comprising fiberglass; and
a depositing a coating overlying the substrate, the coating comprising a binder and a pigment.

[0057] Embodiment 31. The method of embodiment 30, wherein the substrate further comprises thermoplastic fibers, cellulosic fibers, or a combination thereof.

[0058] Embodiment 32. The method of embodiment 30, wherein the substrate comprises woven fibers.

[0059] Embodiment 33. The method of embodiment 30, wherein the substrate comprises non-woven fibers.

[0060] Embodiment 34. The method of embodiment 30, wherein the substrate further comprises a weight of at least 125 g/m^2 and not greater than 200 g/m^2.

[0061] Embodiment 35. The method of embodiment 30, wherein the substrate further comprises a thickness of 0.30mm to 0.40mm.

[0062] Embodiment 36. The method of embodiment 30, wherein the substrate further comprises an opacity of not greater than 96 lux or not greater than 90 lux or not greater than 86 lux.

[0063] Embodiment 37. The method of embodiment 30, wherein the wall finishing system comprises a thickness of 0.40mm to 0.55mm.

[0064] Embodiment 38. The method of embodiment 30, wherein the wall finishing system comprises an opacity of not greater than 55 lux or not greater than 50 lux or not greater than 45 lux.

[0065] Embodiment 39. The method of embodiment 30, wherein the wall finishing system comprises a weight of at least 186 g/m^2 and not greater than 300 g/m^2.

[0066] Embodiment 40. The method of embodiment 30, wherein the coating further comprises water.

[0067] Embodiment 41. The method of embodiment 40, wherein the coating comprises 40 wt.% to 70 wt.% water.

[0068] Embodiment 42. The method of embodiment 30, wherein the coating comprises 15 wt.% to 40 wt.% binder.

[0069] Embodiment 43. The method of embodiment 30, wherein the binder comprises an acrylic, SBR, PVOH, PVAc, urea formaldehyde, phenol formaldehyde, melamine formaldehyde, or a combination thereof.

[0070] Embodiment 44. The method of embodiment 30, wherein the coating comprises 10 wt.% to 30 wt.% pigment.

[0071] Embodiment 45. The method of embodiment 30, wherein the pigment comprises white pigment.

[0072] Embodiment 46. The method of embodiment 30, wherein the pigment comprises white pigment TiO_2, $CaCO_3$, or a combination thereof.

[0073] Embodiment 47. The method of embodiment 30, wherein the coating comprises an antifoam agent.

[0074] Embodiment 48. The method of embodiment 47, wherein the coating comprises 0 to 3 wt. % of antifoaming agent.

[0075] Embodiment 49. The method of embodiment 30, wherein the coating comprises a dispersant.

[0076] Embodiment 50. The method of embodiment 49, wherein the coating comprises 0 to 2 wt. % of dispersant.

[0077] Embodiment 51. The method of embodiment 30, wherein the coating comprises a thickener.

[0078] Embodiment 52. The method of embodiment 49, wherein the coating comprises 0 to 2 wt. % of thickener.

[0079] Embodiment 53. The method of embodiment 30, wherein the coating comprises an additive.

[0080] Embodiment 54. The method of embodiment 53, wherein the coating comprises 0 to 2 wt. % of additives .

[0081] Embodiment 55. The method of embodiment 30, wherein the coating comprises a wetting agent.

[0082] Embodiment 56. The method of embodiment 55, wherein the coating comprises 0 to 4 wt. % of wetting agent.

[0083] Embodiment 57. The method of embodiment 30, wherein a patterned or decorative finish is applied to the coating after it is applied to the substrate.

[0084] Embodiment 58. The method of embodiment 30, further comprising applying a functional backing underlying the coating and the substrate.

[0085] Embodiment 59. The wall finishing system of embodiment 58, wherein the functional backing comprises an adhesive.

[0086] Embodiment 60. The wall finishing system of embodiment 58, wherein the functional backing comprises a roughened surface .

[0087] Embodiment 61. The method of embodiment 30, wherein the wall finishing system comprises the system of any one of embodiments 1 to 29.

[0088] Embodiment 62. A method of finishing a wall comprising applying the wall finishing system of any one of embodiments 1 to 29 to a surface.

[0089] Embodiment 63. The method of embodiment 62, wherein the surface comprises dry wall, plywood, oriented strand board (OSB), fiber-reinforced plastics (FRP), Medium-density fibreboard (MDF), and any other substrate used to close wall cavities.

[0090] 64. The method of embodiment 63, wherein the surface comprises at least two drywall panels, the drywall panels having joints between them, wherein the joints are not visible after the wall finsihing system has been applied.

[0091] Embodiment 65. The method of embodiment 62, wherein the wall finishing system is applied horizontally.

[0092] Embodiment 66. The method of embodiment 62, wherein the wall finishing system creates a seamless aestetic.

Examples

[0093] Samples 1, 2, and CS 1 were prepared according to the procedure below. Fiberglass substrates having the properties in table 1 were provided.

Table 1

Sample	CS1	S1 and S2
Material	Fiberglass (GV130C from Adfors)	Fiberglass (GV130C from Adfors)
Weigth (g/m^2)	124	130
Thickness (mm)	0.38 $\pm$ 0.1	0.38 $\pm$ 0.1
Opacity (Lux)	96	86

(continued)

Sample	CS1	S1 and S2
Air permeability (1/m^2/s) at 1200 Pa	28.8 ± 4.21	25.3 ± 1.67
Tensile strength machine direction (N/5cm)	350.00	350.00
Tensile strength cross machine direction	280	280
(N/5cm)		

[0094] Sample CS1 was coated with 3 layers of a formulation having the compositions described in table 2 below. Each layer was approximately 20.33 g/m2. After each layer is applied, it is cured via the following process. 30 seconds of curing in a 200 °C IR oven followed by 3 min of curing in a 150 °C hot air convection oven followed by 3 min of curing in a 140 °C hot air convection oven.

Table 2

Material	CS1 coating 1 (wt. %)	CS1 coating 2 (wt. %)	CS1 coating 3 (wt. %)
Water	53.728	54.054	54.041
Binder	28.873	24.570	24.564
White pigment	10.545	15.725	15.721
Antifoam	1.958	1.868	1.866
Dispersant	0.979	0.934	0.933
Wetting Agent	1.958	1.916	1.941
Thickener	0.979	0.933	0.934
Additives	0.98	0.000	0.000

[0095] Samples S1 and S2 were coated with 57 g/m^2 and 70 g/m^2 respectively of the formulation below in table 3. Coatings were applied as 3 layers of equal weight with each layer being cured according to the following process. 30 seconds of curing in a 200 °C IR oven followed by 3 min of curing in a 150 °C hot air convection oven followed by 3 min of curing in a 140 °C hot air convection oven.

Table 3

Material	S1 and S2 coating (wt. %)
Water	53.728
Binder	28.873
White pigment	10.545
Antifoam	1.958
Dispersant	0.979
Wetting Agent	1.958
Thickener	0.979
Additives	0.98

[0096] Table 4 includes properties of the finished coated products. Lux was measured according to the following protocol.

[0097] As shown in FIG. 2, a black cylindrical tube 200 was provided having inner diameter 15 cm, outer diameter 16cm, and total length 60 cm. At one end, the cylinder is equipped with a lamp (cm 0-12) 201. The cylinder be split in to two parts at cm 34 via horizontal opening 215. The opposite end houses an LX 101 luxometer (cm 56-60) 205. Between the lamp and the luxometer is empty space 210. When the lamp is on, the luxometer reads 887 lux.

[0098] Samples CS1, S1, and S2 were cut into shapes with diameter of at least 16 cm. The sample is inserted in the opening 215 and the luxometer is read with the lamp on shining through the sample.

Sample	CS1	S1	S2
Weigth (g/m^2)	185	187	200
Thickness (mm)	0.43 ± 0.1	0.48 ± 0.1	0.49 ± 0.1
Opacity (Lux)	58	44	39
Tensile strength machine direction (N/5cm)		405.3 ± 71.6	304.3 ± 82.9
Tensile strength cross machine direction (N/5cm)		422.4 ± 35.1	344.0 ± 18.3

[0099] Benefits, other advantages, and solutions to problems have been described above with regard to specific embodiments. However, the benefits, advantages, solutions to problems, and any feature(s) that may cause any benefit, advantage, or solution to occur or become more pronounced are not to be construed as a critical, required, or essential feature of any or all the claims.

Claims

1. A wall finishing system comprising:

a substrate comprising fiberglass; and
a coating overlying the substrate, the coating comprising a binder and a pigment.

2. The wall finishing system of claim 1, wherein the substrate comprises woven fibers.

3. The wall finishing system of claim 1, wherein the wall finishing system comprises a thickness of 0.40mm to 0.55mm.

4. The wall finishing system of claim 1, wherein the wall finishing system comprises an opacity of not greater than 55 lux.

5. The wall finishing system of claim 1, wherein the wall finishing system comprises a weight of at least 186 $g/m^2$and not greater than 300 g/m^2.

6. The wall finishing system of claim 1, wherein the coating comprises 15 wt.% to 40 wt.% binder.

7. The wall finishing system of claim 1, wherein the binder comprises an acrylic, SBR, PVOH, PVAc, urea formaldehyde, phenol formaldehyde, melamine formaldehyde, or a combination thereof.

8. A method of preparing a wall finshing system comprising:

providing a substrate comprising a substrate comprising fiberglass; and
a depositing a coating overlying the substrate, the coating comprising a binder and a pigment.

9. The method of claim 8, wherein the wall finishing system comprises a thickness of 0.40mm to 0.55mm.

10. The method of claim 8, wherein the substrate comprises woven fibers.

11. The method of claim 8, wherein the wall finishing system comprises an opacity of not greater than 55 lux.

12. The method of claim 8, wherein the wall finishing system comprises a weight of at least 186 $g/m^2$and not greater than 300 g/m^2.

13. The method of claim 8, wherein a patterned or decorative finish is applied to the coating after it is applied to the substrate.

14. The method of claim 8, wherein the binder comprises an acrylic, SBR, PVOH, PVAc, urea formaldehyde, phenol formaldehyde, melamine formaldehyde, or a combination thereof.

15. A method of finishing a wall or substrate comprising applying the wall finishing system of any one of claims 1 to 7 to a

surface.

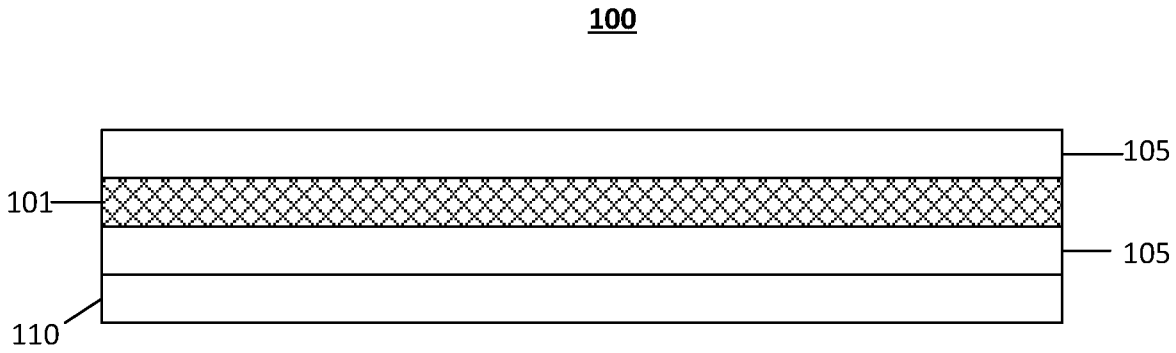

FIG. 1

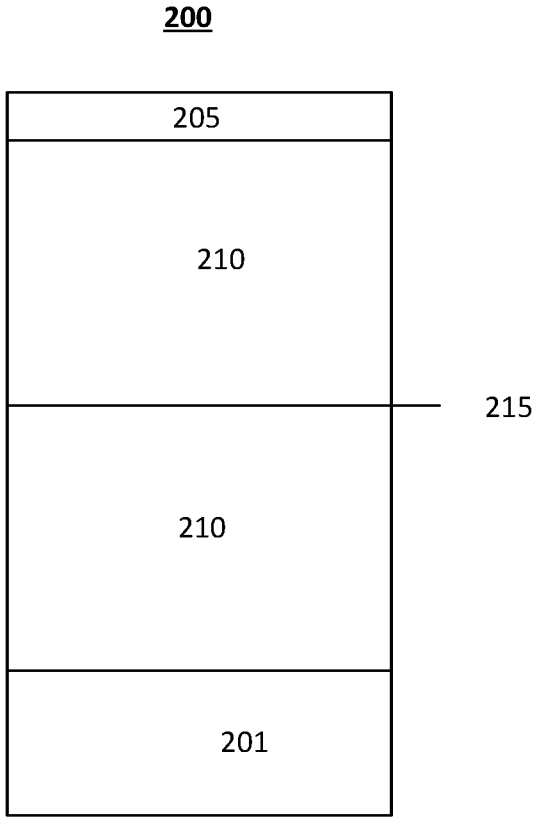

FIG. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 24 30 5068

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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X	US 5 433 997 A (LAND FRANK J [US]) 18 July 1995 (1995-07-18) * claim 1 * * example 1 * * tables 1,3 * -----	1,2,4, 6-8,10, 11,13-15	

TECHNICAL FIELDS SEARCHED (IPC)
D06N B44F E04F B44C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	19 April 2024	Beyazit, Selim

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 24 30 5068

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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19-04-2024

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