[0024]

As described above, the nonwoven fabric substrate 1 has a pattern in which the first aperture region 11a and the second aperture region 11b are alternately arranged at a regular interval in the Y direction, and the regular interval is the non-aperture region 12 formed by the non-aperture portion 3n of the plurality of grooves 3. In this manner, as illustrated in Fig. 1, the non-aperture region 12 is arranged every interval between the first aperture region 11a in which the plurality of diamond-shaped aperture regions 30a are arranged in the X direction, and the second aperture region 11b in which the V-shaped aperture regions 30a are repeatedly arranged in the X direction. In order to surround each of the diamond-shaped aperture regions 30a of the first aperture regions 11a, the non-aperture region 12 of the nonwoven fabric substrate 1 includes a first non-aperture region 12a in which the V-shaped non-aperture regions 31a formed by the non-aperture portion 3n of the plurality of grooves 3 are repeatedly arranged in the X direction, and a second non-aperture regions 12b in which the inverted V-shaped non-aperture regions 31b formed by the non-aperture portion 3n of the plurality of grooves 3 are repeatedly arranged in the X direction. The second non-aperture region 12b has a shape obtained by inverting the first non-aperture region 12a symmetrically relative to the bisector extending in the X direction of the diamond-shaped aperture region 30a. In other words, the first non-aperture region 12a and the second non-aperture region 12b are shifted in the X direction by a half pitch. Similarly to one side forming the V-shaped aperture region 30b, one side of the V-shaped non-aperture region 31a forming the first non-aperture region 12a extends to form the angle β (see Fig. 1) between the one side and the straight line extending in the X direction. The other side forming the V-shaped non-aperture region 31a is formed by inverting the one side symmetrically relative to the line extending in the Y direction. In the first non-aperture region 12a, the V-shaped non-aperture regions 31a formed in this way are repeatedly arranged in the X direction, and as in the second aperture region 11b, the first non-aperture region 12a is formed in a jagged shape such as the saw teeth extending in the X direction. Similarly to the first non-aperture region 12a, in the second non-aperture region 12b, the inverted V-shaped non-aperture regions 31b are also repeatedly arranged in the X direction, and the second non-aperture regions 12b is formed in a jagged shape such as the saw teeth extending in the X direction.

[0025]

CLAIMS

1. A nonwoven fabric substrate for wiping sheet in which ridges and grooves are alternately formed at positions corresponding to each other on each of both surfaces, and apertures penetrating the grooves of both surfaces are formed,

wherein the ridges and the grooves extend parallel to each other, and extend in a direction intersecting with each of a pair of both sides extending in parallel of the nonwoven fabric substrate for wiping sheet,

in planar view, each of the grooves alternately includes an aperture portion which has a plurality of the apertures, and a non-aperture portion which has no aperture and is longer than a distance between the nearest end portions of the adjacent apertures in the aperture portion, and an arrangement pattern of the aperture portions and the non-aperture portions provided in the grooves is different from an arrangement pattern of the aperture portions and the non-aperture portions provided in the grooves adjacent to the grooves,

when a whole of the nonwoven fabric substrate for wiping sheet is seen in planar view, the nonwoven fabric substrate for wiping sheet includes an aperture region formed by the aperture portions of the plurality of grooves, and a non-aperture region formed by the non-aperture portions of the plurality of grooves, and

each of the aperture region and the non-aperture region is arranged in a predetermined pattern.

2. The nonwoven fabric substrate for wiping sheet according to claim 1,

wherein each of the aperture region and the non-aperture region is arranged in a pattern in which each of an extending direction of the aperture region and an extending direction of the non-aperture region intersects with the extending direction of each of the ridges and the grooves.

3. The nonwoven fabric substrate for wiping sheet according to claim 1 or 2,

wherein the apertures are formed by dividing and rearranging constituent fibers of the nonwoven fabric substrate.

4. The nonwoven fabric substrate for wiping sheet according to any one of claims

1 to 3,

wherein the aperture regions are arranged in a pattern in which a particular shape is periodically repeated in the extending direction of the aperture regions.

5. The nonwoven fabric substrate for wiping sheet according to any one of claims 1 to 4,

wherein the non-aperture regions are arranged in a pattern in which a particular shape is periodically repeated in the extending direction of the non-aperture regions.

6. The nonwoven fabric substrate for wiping sheet according to any one of claims 1 to 5,

wherein the aperture regions are arranged in a pattern in which a particular shape is periodically repeated in the extending direction of the aperture regions, and

the aperture regions are repeatedly arranged with the non-aperture region interposed therebetween in a direction orthogonal to the extending direction of the aperture regions, and a period of the particular shape in the adjacent aperture regions having the particular shape is shifted by a half pitch.

7. The nonwoven fabric substrate for wiping sheet according to any one of claims 1 to 6,

wherein the non-aperture regions are arranged in a pattern in which a particular shape is periodically repeated in the extending direction of the non-aperture regions, and

the non-aperture regions are repeatedly arranged with the aperture region interposed therebetween in a direction orthogonal to the extending direction of the non-aperture regions, and a period of the particular shape in the non-aperture region having the particular shape is shifted by a half pitch from at least one of other adjacent non-aperture regions.

8. The nonwoven fabric substrate for wiping sheet according to any one of claims 1 to 7,

wherein the aperture regions include a first aperture region arranged in a pattern in which a diamond shape is periodically repeated, and a second aperture region arranged in a pattern in which a V shape is periodically repeated, in the extending

direction of the aperture regions, and the first aperture region and the second aperture region have a pattern arranged alternately with the non-aperture region interposed therebetween in a direction orthogonal to the extending direction of the aperture regions.

9. The nonwoven fabric substrate for wiping sheet according to claim 8,

wherein the non-aperture regions include a first non-aperture region in which the V shape formed by the non-aperture portions of the plurality of grooves is repeatedly arranged in the extending direction of the non-aperture regions, and a second non-aperture region in which an inverted V shape formed by the non-aperture portions of the plurality of grooves is repeatedly arranged in the extending direction of the non-aperture regions, so as to surround the diamond shape of the first aperture region.

10. The nonwoven fabric substrate for wiping sheet according to any one of claims 1 to 9,

wherein the nonwoven fabric substrate for wiping sheet is impregnated with a chemical solution.

[0024]

As described above, the nonwoven fabric substrate 1 has a pattern in which the first aperture region 11a and the second aperture region 11b are alternately arranged at a regular interval in the Y direction, and the regular interval is the non-aperture region 12 formed by the non-aperture portion 3n of the plurality of grooves 3. In this manner, as illustrated in Fig. 1, the non-aperture region 12 is arranged every interval between the first aperture region 11a in which the plurality of diamond-shaped aperture regions 30b are arranged in the X direction, and the second aperture region 11b in which the V-shaped aperture regions 30a are repeatedly arranged in the X direction. In order to surround each of the diamond-shaped aperture regions 30a of the first aperture regions 11a, the non-aperture region 12 of the nonwoven fabric substrate 1 includes a first non-aperture region 12a in which the V-shaped non-aperture regions 31a formed by the non-aperture portion 3n of the plurality of grooves 3 are repeatedly arranged in the X direction, and a second non-aperture regions 12b in which the inverted V-shaped non-aperture regions 31b formed by the non-aperture portion 3n of the plurality of grooves 3 are repeatedly arranged in the X direction. The second non-aperture region 12b has a shape obtained by inverting the first non-aperture region 12a symmetrically relative to the bisector extending in the X direction of the diamond-shaped aperture region 30a. In other words, the first non-aperture region 12a and the second non-aperture region 12b are shifted in the X direction by a half pitch. Similarly to one side forming the V-shaped aperture region 30b, one side of the V-shaped non-aperture region 31a forming the first non-aperture region 12a extends to form the angle β (see Fig. 1) between the one side and the straight line extending in the X direction. The other side forming the V-shaped non-aperture region 31a is formed by inverting the one side symmetrically relative to the line extending in the Y direction. In the first non-aperture region 12a, the V-shaped non-aperture regions 31a formed in this way are repeatedly arranged in the X direction, and as in the second aperture region 11b, the first non-aperture region 12a is formed in a jagged shape such as the saw teeth extending in the X direction. Similarly to the first non-aperture region 12a, in the second non-aperture region 12b, the inverted V-shaped non-aperture regions 31b are also repeatedly arranged in the X direction, and the second non-aperture regions 12b is formed in a jagged shape such as the saw teeth extending in the X direction.

[0025]

CLAIMS

1. A nonwoven fabric substrate for wiping sheet in which ridges and grooves are alternately formed at positions corresponding to each other on each of both surfaces, and apertures penetrating the grooves of both surfaces are formed,

wherein the ridges and the grooves extend parallel to each other, and extend in a direction intersecting with each of a pair of both sides extending in parallel of the nonwoven fabric substrate for wiping sheet,

in planar view, each of the grooves alternately includes an aperture portion which has a plurality of the apertures, and a non-aperture portion which has no aperture and is longer than a distance between the nearest end portions of the adjacent apertures in the aperture portion, and an arrangement pattern of the aperture portions and the non-aperture portions provided in the grooves is different from an arrangement pattern of the aperture portions and the non-aperture portions provided in the grooves adjacent to the grooves,

when a whole of the nonwoven fabric substrate for wiping sheet is seen in planar view, the nonwoven fabric substrate for wiping sheet includes an aperture region formed by the aperture portions of the plurality of grooves, and a non-aperture region formed by the non-aperture portions of the plurality of grooves, and

each of the aperture region and the non-aperture region is arranged in a predetermined pattern.

2. The nonwoven fabric substrate for wiping sheet according to claim 1,

wherein each of the aperture region and the non-aperture region is arranged in a pattern in which each of an extending direction of the aperture region and an extending direction of the non-aperture region intersects with the extending direction of each of the ridges and the grooves.

3. The nonwoven fabric substrate for wiping sheet according to claim 1 or 2,

wherein the apertures are formed by dividing and rearranging constituent fibers of the nonwoven fabric substrate.

4. The nonwoven fabric substrate for wiping sheet according to any one of claims

1 to 3,

wherein the aperture regions are arranged in a pattern in which a particular shape is periodically repeated in the extending direction of the aperture regions.

5. The nonwoven fabric substrate for wiping sheet according to any one of claims 1 to 4, wherein the aperture regions are arranged in a pattern in which a particular shape of a diamond shape or a V shape is periodically repeated in the extending direction of the aperture region.

6. The nonwoven fabric substrate for wiping sheet according to any one of claims 1 to 5,

wherein the non-aperture regions are arranged in a pattern in which a particular shape is periodically repeated in the extending direction of the non-aperture regions.

7. The nonwoven fabric substrate for wiping sheet according to any one of claims 1 to 6, wherein the non-aperture regions are arranged in a pattern in which a particular shape of a V shape is periodically repeated in the extending direction of the non-aperture region.

8. The nonwoven fabric substrate for wiping sheet according to any one of claims 1 to 7,

wherein the aperture regions are arranged in a pattern in which a particular shape is periodically repeated in the extending direction of the aperture regions, and

the aperture regions are repeatedly arranged with the non-aperture region interposed therebetween in a direction orthogonal to the extending direction of the aperture regions, and a period of the particular shape in the adjacent aperture regions having the particular shape is shifted by a half pitch.

9. The nonwoven fabric substrate for wiping sheet according to any one of claims 1 to 8, wherein the aperture regions are arranged in a pattern in which a particular shape of a diamond shape or a V shape is periodically repeated in the extending direction of the aperture regions, and

the aperture regions are repeatedly arranged with the non-aperture region

interposed therebetween in a direction orthogonal to the extending direction of the aperture regions, and a period of the particular shape in the adjacent aperture regions having the same particular shape is shifted by a half pitch.

10. The nonwoven fabric substrate for wiping sheet according to any one of claims 1 to 9,

wherein the non-aperture regions are arranged in a pattern in which a particular shape is periodically repeated in the extending direction of the non-aperture regions, and

the non-aperture regions are repeatedly arranged with the aperture region interposed therebetween in a direction orthogonal to the extending direction of the non-aperture regions, and a period of the particular shape in the non-aperture region having the particular shape is shifted by a half pitch from at least one of other adjacent non-aperture regions.

11. The nonwoven fabric substrate for wiping sheet according to any one of claims 1 to 10, wherein the non-aperture regions are arranged in a pattern in which a particular shape of a V shape is periodically repeated in the extending direction of the non-aperture regions, and

the non-aperture regions are repeatedly arranged with the aperture region interposed therebetween in a direction orthogonal to the extending direction of the non-aperture regions, and the period of the particular shape in the non-aperture region having the particular shape is shifted by a half pitch from at least one of the adjacent other non-aperture regions.

12. The nonwoven fabric substrate for wiping sheet according to any one of claims 1 to 11, wherein the non-aperture regions have a constant width in the extending direction of the non-aperture regions, and the width is wider than an interval between the apertures adjacent to each other in the direction of the grooves in the aperture portions.

13. The nonwoven fabric substrate for wiping sheet according to any one of claims 1 to 12,

wherein the aperture regions include a first aperture region arranged in a

pattern in which a diamond shape is periodically repeated, and a second aperture region arranged in a pattern in which a V shape is periodically repeated, in the extending direction of the aperture regions, and the first aperture region and the second aperture region have a pattern arranged alternately with the non-aperture region interposed therebetween in a direction orthogonal to the extending direction of the aperture regions.

14. The nonwoven fabric substrate for wiping sheet according to claim 13,

wherein the non-aperture regions include a first non-aperture region in which the V shape formed by the non-aperture portions of the plurality of grooves is repeatedly arranged in the extending direction of the non-aperture regions, and a second non-aperture region in which an inverted V shape formed by the non-aperture portions of the plurality of grooves is repeatedly arranged in the extending direction of the non-aperture regions, so as to surround the diamond shape of the first aperture region.

15. The nonwoven fabric substrate for wiping sheet according to claim 14, wherein the width of the first non-aperture region and the width of the second non-aperture region are formed in the same width.

16. The nonwoven fabric substrate for wiping sheet according to any one of claims 1 to 15,

wherein the nonwoven fabric substrate for wiping sheet is impregnated with a chemical solution.

17. The nonwoven fabric substrate for wiping sheet according to claim 16, wherein the chemical solution is an aqueous cleaning agent.

18. The nonwoven fabric substrate for wiping sheet according to claim 17, wherein the aqueous cleaning agent contains a surfactant.

19. The nonwoven fabric substrate for wiping sheet according to claim 17 or 18, wherein the aqueous cleaning agent contains an alkaline agent.

20. The nonwoven fabric substrate for wiping sheet according to any one of claims 17 to 19, wherein the aqueous cleaning agent contains a water-soluble solvent.

21. The nonwoven fabric substrate for wiping sheet according to any one of claims 17 to 20, wherein the aqueous cleaning agent contains a disinfectant.

22. The nonwoven fabric substrate for wiping sheet according to claim 21, wherein the disinfectant is isothiazolin-based disinfectant.

23. The nonwoven fabric substrate for wiping sheet according to any one of claims 17 to 22, containing the disinfectant other than polyhexamethylene biguanide or poly (hexamethylene) biguanide hydrochloride.

24. The nonwoven fabric substrate for wiping sheet according to claim 16, wherein the chemical solution is selected from at least one of mineral oil, synthetic oil, silicone oil, and wax.