CLAIMS

1. A manufacturing method of a water absorbing material comprising:

an obtaining step of separating gypsum from a gypsum board to obtain paper powder; and

a granulating step of granulating a raw material containing the paper powder obtained in the obtaining step,

wherein in the obtaining step, the gypsum is separated from the gypsum board with a separation device so that a weight ratio of the gypsum adhering to the paper powder with respect to the paper powder will be 5% or less,

the separation device includes:

a first shredding unit that shreds the gypsum board; and

a first separation unit that has a first tubular portion in which a large number of first holes that allow the gypsum to pass through without allowing paper pieces contained in the gypsum board shredded by the first shredding unit to pass through are formed, and that separates the gypsum passing through the first holes from the gypsum board by rotating the first tubular portion in a state in which the gypsum board shredded by the first shredding unit is accommodated in the first tubular portion, and

an inside of the first tubular portion is provided with a rotating rod that has a central axis coinciding with a central axis of the first tubular portion and is rotatable about the central axis, and a screw member that is helically provided around the rotating rod and has a plurality of teeth formed in the screw member.

2. The manufacturing method of the water absorbing material according to claim 1,

wherein the separation device includes a first ridge that is provided on

an inner circumferential surface of the first tubular portion and that extends in a direction in which the central axis of the first tubular portion extends.

3. The manufacturing method of the water absorbing material according to claim 2,

wherein "p" of said first ridges are present, "p" being an integer between 3 and 5 inclusive, and the "p" first ridges are arranged on the inner circumferential surface of the first tubular portion at regular intervals.

4. The manufacturing method of the water absorbing material according to any of claims 1 to 3,

wherein the separation device includes a first air pipe for transferring the gypsum board shredded by the first shredding unit to the first separation unit with air pressure, and

the first air pipe has a first portion that extends in a first direction and a second portion that is connected to the first portion on a downstream side of the first portion and that extends in a second direction substantially orthogonal to the first direction.

5. The manufacturing method of the water absorbing material according to claim 4,

wherein the separation device includes a first uneven surface that is present in a connecting portion between the first portion and the second portion of the first air pipe and with which the gypsum board transferred through the first portion collides.

6. The manufacturing method of the water absorbing material according to claim 4 or 5,

wherein the first air pipe has a third portion that is connected to the

second portion on a downstream side of the second portion and that extends in a third direction substantially orthogonal to the second direction.

7. The manufacturing method of the water absorbing material according to claim 6,

wherein the separation device includes a second uneven surface that is present in a connecting portion between the second portion and the third portion of the first air pipe and with which the gypsum board transferred through the second portion collides.

8. The manufacturing method of the water absorbing material according to any of claims 1 to 7,

wherein the separation device includes a second air pipe for transferring the gypsum board from which the gypsum passing through the first holes is separated by the first separation unit with air pressure, and

the second air pipe has a first portion that extends in a first direction and a second portion that is connected to the first portion on a downstream side of the first portion and that extends in a second direction substantially orthogonal to the first direction.

9. The manufacturing method of the water absorbing material according to claim 8,

wherein the separation device includes a third uneven surface that is present in a connecting portion between the first portion and the second portion of the second air pipe and with which the gypsum board transferred through the first portion collides.

10. The manufacturing method of the water absorbing material according to claim 8 or 9,

wherein the second air pipe has a third portion that is connected to the second portion on a downstream side of the second portion and that extends in a third direction substantially orthogonal to the second direction.

11. The manufacturing method of the water absorbing material according to claim 10,

wherein the separation device includes a fourth uneven surface that is present in a connecting portion between the second portion and the third portion of the second air pipe and with which the gypsum board transferred through the second portion collides.

12. The manufacturing method of the water absorbing material according to any of claims 1 to 11,

wherein the separation device includes:

a second shredding unit that shreds the gypsum board from which the gypsum passing through the first holes is separated by the first separation unit; and

a second separation unit that has a second tubular portion in which a large number of second holes that allow the gypsum to pass through without allowing the paper pieces contained in the gypsum board shredded by the second shredding unit to pass through are formed, and that separates the gypsum passing through the second holes from the gypsum board by rotating the second tubular portion in a state in which the gypsum board shredded by the second shredding unit is accommodated in the second tubular portion.

13. The manufacturing method of the water absorbing material according to claim 12,

wherein an area of each of the second holes in a plan view is smaller than an area of each of the first holes in a plan view.

14. The manufacturing method of the water absorbing material according to claim 12 or 13,

wherein the separation device includes a second ridge that is provided on an inner circumferential surface of the second tubular portion and that extends in a direction in which the central axis of the second tubular portion extends.

15. The manufacturing method of the water absorbing material according to claim 14,

wherein "q" of said second ridges are present, "q" being an integer between 3 and 5 inclusive, and the "q" second ridges are arranged on the inner circumferential surface of the second tubular portion at regular intervals.

16. The manufacturing method of the water absorbing material according to any of claims 12 to 15,

wherein the separation device includes a third air pipe for transferring the gypsum board shredded by the second shredding unit to the second separation unit with air pressure, and

the third air pipe has a first portion that extends in a first direction and a second portion that is connected to the first portion on a downstream side of the first portion and that extends in a second direction substantially orthogonal to the first direction.

17. The manufacturing method of the water absorbing material according to claim 16,

wherein the separation device includes a fifth uneven surface that is present in a connecting portion between the first portion and the second portion of the third air pipe and with which the gypsum board transferred

through the first portion collides.

18. The manufacturing method of the water absorbing material according to claim 16 or 17,

wherein the third air pipe has a third portion that is connected to the second portion on a downstream side of the second portion and that extends in a third direction substantially orthogonal to the second direction.

19. The manufacturing method of the water absorbing material according to claim 18,

wherein the separation device includes a sixth uneven surface that is present in a connecting portion between the second portion and the third portion of the third air pipe and with which the gypsum board transferred through the second portion collides.

20. The manufacturing method of the water absorbing material according to any of claims 1 to 19,

wherein the obtaining step includes a heating step of heating the gypsum to put the gypsum into a state of hemihydrate gypsum.

21. The manufacturing method of the water absorbing material according to any of claims 1 to 20, comprising a coating step of coating a granule granulated in the granulating step with a coating material.

22. The manufacturing method of the water absorbing material according to claim 21,

wherein the coating material contains fluff pulp and a water-absorbent polymer that are separated from a disposable diaper.

23. The manufacturing method of the water absorbing material according to claim 21 or 22,

wherein the coating step includes an adding step of adding the gypsum separated from the gypsum board in the obtaining step to the coating material.

24. The manufacturing method of the water absorbing material according to claim 23,

wherein a weight ratio of the gypsum added to the coating material with respect to the whole coating material is between 1% and 5% inclusive.