CLAIMS

1. A pretreatment mixing and stirring device~~,~~ ~~arranged at a stage prior to a slurry formation mixing and stirring device which forms a gypsum slurry by kneading a calcined gypsum and water, and performing~~ configured to perform a pretreatment by mixing a calcined gypsum with one or more kinds of additives selected from liquids and powders, comprising:

a cylindrical housing having a top plate, a bottom plate arranged to oppose to the top plate, a side plate arranged between the top plate and the bottom plate, and a mixing and stirring region ~~where the calcined gypsum and the additive are mixed and stirred~~ in an interior surrounded by the top plate, the bottom plate, and the side plate;

a disk-shaped rotating plate arranged inside the housing;

a rotating drive shaft, penetrating the top plate or the bottom plate of the housing, and coupled to the rotating plate;

a calcined gypsum supply port, arranged in the top plate, and configured to supply the calcined gypsum to the mixing and stirring region; and

an additive supply port, arranged in ~~one of or both of the top plate and~~ the side plate, and configured to supply the additive to the mixing and stirring region,

wherein the rotating plate mixes and stirs the calcined gypsum and the additive in the mixing and stirring region when rotated by the rotating drive shaft.

2. The pretreatment mixing and stirring device as claimed in claim 1, further comprising:

a discharge port configured to discharge a gypsum mixture which is mixed and stirred in the mixing and stirring region,

wherein the discharge port is provided in the bottom plate or the side plate.

3. The pretreatment mixing and stirring device as claimed in claim 1 or 2, wherein the additive supply port is arranged above a top surface of the ~~rotary~~ rotating plate.

4. The pretreatment mixing and stirring device as claimed in any one of claims 1 to 3, further comprising:

at least one rod-shaped scraper arranged above a top surface of the rotating plate and inside the mixing and stirring region,

wherein one end of the scraper is arranged in a central region of the rotating plate, and the other end of the scraper, opposite the one end, is arranged on an outer circumference of the rotating plate.

5. The pretreatment mixing and stirring device as claimed in any one of claims 1 to 4, wherein

the rotating plate has a cutout portion and a teeth portion arranged in an outer peripheral region of the rotating plate, and

an angle between a surface of the teeth portion

positioned in front along a rotating direction of the rotating plate, and a lower end surface of the teeth portion is 90 degrees or less.

6. A gypsum slurry manufacturing apparatus comprising:

the pretreatment mixing and stirring device according to any one of claims 1 to 5; and

~~the~~ a slurry formation mixing and stirring device configured to form the gypsum slurry by kneading the calcined gypsum, pretreated by the pretreatment mixing and stirring device, and water.

7. The gypsum slurry manufacturing apparatus as claimed in claim 6, further comprising:

a gypsum waste reducing section, arranged between ~~the~~ a discharge port of the pretreatment mixing and stirring device and a pretreatment calcined gypsum supply port of the slurry formation mixing and stirring device, configured to reduce and remove gypsum waste.

8. A building board manufacturing apparatus comprising:

the gypsum slurry manufacturing apparatus according to claim 6 or 7.

9. A pretreatment calcined gypsum manufacturing method for manufacturing a pretreatment calcined gypsum by mixing a calcined gypsum and one or more kinds of

additives selected from liquids and powders using a pretreatment mixing and stirring device comprising a cylindrical housing having a top plate, a bottom plate arranged to oppose to the top plate, a side plate arranged between the top plate and the bottom plate, and a mixing and stirring region in an interior surrounded by the top plate, the bottom plate, and the side plate; a disk-shaped rotating plate arranged inside the housing; a rotating drive shaft, penetrating the top plate or the bottom plate of the housing, and coupled to the rotating plate; a calcined gypsum supply port, arranged in the top plate, and configured to supply the calcined gypsum to the mixing and stirring region; and an additive supply port, arranged in one of or both of the top plate and the side plate, and configured to supply the additive to the mixing and stirring region, the pretreatment calcined gypsum manufacturing method comprising:

a raw material supply process which supplies the calcined gypsum from the calcined gypsum supply port, and the additive from the additive supply port~~, using the pretreatment mixing and stirring device according to any one of claims 1 to 5~~; and

a mixing and stirring process which rotates the rotating plate by rotating the rotating drive shaft, to thereby mix and stir the calcined gypsum and the additive in the mixing and stirring region.

10. The pretreatment calcined gypsum manufacturing method as claimed in claim 9, further comprising:

a discharge process which discharges the gypsum mixture produced by the mixing and stirring process via a

discharge port of the pretreatment mixing and stirring device.

11. The pretreatment calcined gypsum manufacturing method as claimed in claim 9 or 10, wherein the raw material supply process supplies the calcined gypsum and the additive so that a ratio of the additive is 0.01 parts or greater and 10 parts or less, with respect to 100 parts of the calcined gypsum.

12. A gypsum slurry manufacturing method comprising:

a gypsum slurry preparing process which prepares a gypsum slurry by kneading the pretreatment calcined gypsum manufactured by the pretreatment calcined gypsum manufacturing method according to any one of claims 9 to 11, and water.

13. A building board manufacturing method comprising:

a building board manufacturing process which manufactures a building board using the gypsum slurry manufactured by the gypsum slurry manufacturing method according to claim 12.

14. The building board manufacturing method as claimed in claim 13, wherein the building board is a gypsum board.