Claims

1. An impact-reducing uniform-flowing disc, characterized in that, comprising a tower tray (100), a material falling pipe (200) penetrating through the tower tray (100), and an impact-reducing device (300) configured to buffer the kinetic energy of an obliquely falling material flow, wherein, the impact-reducing device (300) has a guide surface configured to guide the obliquely falling material flow to flow along the guide surface and fall to the tower tray (100), and overflow holes (201) are provided at a portion of the material falling pipe (200) above the tower tray (100), and wherein, the impact-reducing uniform-flowing disc comprises a plurality of the material falling pipes (200) and a plurality of the impact-reducing devices (300) configured to provide buffering falling material function for the plurality of material falling pipes (200).

2. The impact-reducing uniform-flowing disc according to claim 1, wherein, the impact-reducing device (300) comprises a plate (310) provided above the material falling pipe (200) and configured to cover the top end of the material falling pipe (200).

3. The impact-reducing uniform-flowing disc according to claim 2, wherein, the impact-reducing device (300) comprises a side wall (320) extending upward from the edge of the plate (310).

4. The impact-reducing uniform-flowing disc according to claim 3, wherein, a first tooth slot (321) is provided on at least a part of the top edge of the side wall (320).

5. The impact-reducing uniform-flowing disc according to claim 2, wherein, the impact-reducing device (300) comprises a plurality of baffle portions (330) that extend upward from the plate (310) and face the falling material flow, the baffle portion (330) extend from one side of the plate (310) to the other side of the plate (310), and a material discharge channel is formed between adjacent baffle portions (330).

6. The impact-reducing uniform-flowing disc according to claim 5, wherein, the plurality of baffle portions (330) are parallel to each other and their plate surfaces are spaced from each other at an interval, and/or the baffle portions (330) extend upward vertically from the plate (310).

7. The impact-reducing uniform-flowing disc according to claim 5, wherein, the baffle portion (330) is provided with a communicating hole (331) penetrating through the baffle portion (330).

8. The impact-reducing uniform-flowing disc according to claim 7, wherein, the top end of the material falling pipe (200) has a notch so that the top end has a top surface (210) and a notch surface (220) below the top surface (210), and the plate (310) is connected to the top surface (210).

9. The impact-reducing uniform-flowing disc according to claim 2, wherein, the plate (310) is connected to the material falling pipe (200) via a first connecting member (311), and/or there is a clearance between the plate (310) and the top end of the material falling pipe (200).

10. The impact-reducing uniform-flowing disc according to claim 1, wherein, the impact-reducing device (300) comprises a barrier grating (340) located above the material falling pipe (200).

11. The impact-reducing uniform-flowing disc according to claim 10, wherein, the barrier grating (340) comprises a plurality of grating plates (341) that are arranged obliquely in relation to the extending direction of the material falling pipe (200) and face the falling material flow, and the plurality of grating plates (341) are parallel to each other and their plate surfaces are spaced from each other at an interval.

12. The impact-reducing uniform-flowing disc according to claim 11, wherein, the barrier grating (340) comprises a connecting rod (342) that connects the plurality of the grating plates (341).

13. The impact-reducing uniform-flowing disc according to claim 10, wherein, the barrier grille (340) is connected to the material falling pipe (200) via a second connecting member (343), and/or there is a clearance between the barrier grating (340) and the top end of the material falling pipe (200).

14. The impact-reducing uniform-flowing disc according to claim 1, wherein, the impact-reducing device (300) comprises a plurality of cylindrical members (350) that are sleeved over each other in sequence, the bottoms of the cylindrical members (350) are connected to the tray surface of the tower tray (100), the plurality of the material falling pipes (200) are provided between adjacent cylindrical members (350), and the top of the cylindrical member (350) is higher than the top end of the material falling pipe (200).

15. The impact-reducing uniform-flowing disc according to claim 14, wherein, the cylindrical members (350) are arranged perpendicular to the tray surface.

16. The impact-reducing uniform-flowing disc according to claim 14, wherein, the cylindrical wall of the cylindrical member (350) is provided with a through-hole (351) penetrating through the cylindrical wall.

17. The impact-reducing uniform-flowing disc according to claim 16, wherein, a plurality of the through-holes (351) are provided circumferentially around the cylindrical member (350), and/or the height of the through-holes (351) corresponds to the height of the overflow holes (201).

18. The impact-reducing uniform-flowing disc according to claim 1, wherein, the impact-reducing device (300) comprises an impact-reducing plate (360) provided at a side of the material falling pipe (200) that faces the falling material, and the top of the impact-reducing plate (360) is higher than the top end of the material falling pipe (200).

19. The impact-reducing uniform-flowing disc according to claim 18, wherein, the impact-reducing plate (360) is arranged perpendicular to the tray surface of the tower tray.

20. The impact-reducing uniform-flowing disc according to claim 19, wherein, the impact-reducing plate (360) is fixed to the top of the material falling pipe (200), and wherein: the impact-reducing plate (360) is a flat plate (361); or the impact-reducing plate (360) is a first bent plate (362) that embraces the material falling pipe (200).

21. The impact-reducing uniform-flowing disc according to claim 19, wherein, the impact-reducing plate (360) is a second bent plate (363) that embraces the material falling pipe (200), the end of the bent edge of the second bent plate (363) is formed with a direct surface (363a) that guides the material flowing inwardly, the overflow holes (201) are provided at a part of the material falling pipe (200) away from the second bent plate (363), and the top end of the second bent plate (363) is not lower than the top end of the material falling pipe (200).

22. The impact-reducing uniform-flowing disc according to claim 1, wherein, the impact-reducing device (300) comprises an impact-reducing sleeve sleeved over the upper part of the material falling pipe (200), the top of the impact-reducing sleeve (370) is higher than the top of the material falling pipe, and there is a side clearance between the impact-reducing sleeve (370) and the material falling pipe (200).

23. The impact-reducing uniform-flowing disc according to claim 22, wherein, the impact-reducing sleeve (370) is fixed to the material falling pipe (200) via a third connecting member (371), and/or the edge of the top end of the impact-reducing sleeve (370) is provided with a second tooth slot.

24. The impact-reducing uniform-flowing disc according to claim 1, wherein, the material falling pipe (200) is a structure that has a filter function.

25. The impact-reducing uniform-flowing disc according to claim 24, wherein, the material falling pipe (200) is formed by a mesh filter member; or the material falling pipe (200) comprises a pipe body (230) and a filter screen (240) wrapped on the circumference of the pipe body (230).

26. The impact-reducing uniform-flowing disc according to claim 1, wherein, the tower tray (100) comprises a plurality of tower tray parts (110) that form the tray surface of the tower tray (100) via a fitting member (120), and the tower tray (100) further comprises a supporting member (130) that support the tray surface.

27. The impact-reducing uniform-flowing disc according to claim 1, wherein, there are a plurality of the impact-reducing devices (300) corresponding to each of the material falling pipes (200) respectively.

28. The impact-reducing uniform-flowing disc according to claim 1, wherein, the edges of the tower tray are formed with bent edges (140) that are bent upward.

29. A reactor, characterized in that, comprising an inlet diffuser and the impact-reducing uniform-

flowing disc according to any of claims 1-28, wherein, the impact-reducing uniform-flowing disc is arranged in a top closure of the reactor or at the top end of a reactor shell of the reactor, and the inlet diffuser is configured to feed the material to the impact-reducing uniform-flowing disc.

30. The reactor according to claim 29, wherein, the impact-reducing uniform-flowing disc is provided at the top end of the reactor shell of the reactor, and is above the topmost distribution tray of the reactor.

31. The reactor according to claim 29, wherein, the reactor is a hydrogenation reactor.