CLAIMS

What is claimed is:

1. A gap blocker for a roller conveyor having rollers for conveying an object in a downstream longitudinal direction, the rollers including a pair of adjacent rollers having a longitudinally extending gap therebetween and at least one of the adjacent rollers having an annular groove for receiving a drive member, the gap blocker comprising:

a body configured to be supported in the gap by the adjacent rollers;

an upper blocking portion of the body to extend across the gap; and

a locating member of the body configured to extend into the annular groove and inhibit lateral movement of the body in the gap.

2. The gap blocker of claim 1 wherein the body includes a resilient portion connecting the upper blocking portion and the locating member, the resilient portion of the body permitting the locating member to resiliently shift relative to the upper blocking portion for positioning the body in the gap.

3. The gap blocker of claim 1 wherein the locating member is below the upper blocking portion with the body supported in the gap by the adjacent rollers.

4. The gap blocker of claim 1 wherein the upper blocking portion includes upstream and downstream upper contact portions for slidingly contacting corresponding ones of the adjacent rollers above a narrowest portion of the gap between the adjacent rollers;

wherein the body includes a lower portion configured to slidingly contact at least one of the adjacent rollers below the narrowest portion of the gap during roller conveyor operation; and

wherein the locating member includes a protrusion vertically intermediate the upper blocking portion and the lower portion that extends into the annular groove of the at least one roller.

5. The gap blocker of claim 1 wherein the locating member includes a protrusion to extend into the annular groove of the at least one roller, the protrusion having a thickness in a lateral direction that is less than a maximum lateral width of the annular groove.

6. The gap blocker of claim 1 wherein the locating member includes a pair of protrusions configured to contact opposite sides of the annular groove.

7. The gap blocker of claim 1 wherein the locating member includes a pair of laterally spaced wall portions configured to contact opposite sides of the annular groove.

8. The gap blocker of claim 1 wherein the locating member includes a pair of surface portions to engage side surface portions of the annular groove and a recess laterally intermediate the surface portions of the locating member.

9. The gap blocker of claim 1 wherein the locating member includes a convex surface portion configured to engage a concave surface portion of the annular groove.

10. The gap blocker of claim 1 wherein the locating member includes a generally arcuate edge configured to extend into the annular groove.

11. The gap blocker of claim 1 wherein the body includes a resilient leg portion extending downwardly; and

wherein the resilient leg portion includes the locating member.

12. The gap blocker of claim 11 wherein the locating member comprises a free end portion of the resilient leg portion.

13. The gap blocker of claim 11 wherein the resilient leg portion includes a slotted through opening defining a periphery of the locating member, the locating member including a base portion and a free end portion, the free end portion having a protrusion to extend into the annular groove.

14. The gap blocker of claim 1 wherein the upper blocking portion includes upstream and downstream contact portions for slidingly contacting corresponding ones of the adjacent rollers; and

wherein the body includes lower leg portions spaced longitudinally from one another.

15. The gap blocker of claim 1 wherein the locating member includes an upper locating member configured to extend in the groove above a narrowest portion of the gap between the adjacent rollers and a lower locating member configured to extend in the groove below the narrowest portion of the gap with the body supported in the gap by the adjacent rollers.

16. The gap blocker of claim 1 wherein the upper blocking portion includes a recess to be positioned below an upper run of the drive member and raised portions extending along either side of the recess.

17. The gap blocker of claim 1 wherein the locating member includes a first locating member configured to extend into the annular groove of one of the adjacent rollers and a second locating member configured to extend into the annular groove of another one of the adjacent rollers.

18. A drive member protector for a roller conveyor having rollers, a gap between a pair of adjacent rollers, and a drive member for rotating the adjacent rollers, the drive member protector comprising:

a body configured for being positioned in the gap;

an upper portion of the body having a recess to be positioned below an upper run of the drive member; and

raised portions of the upper portion extending along either side of the recess to inhibit ingress of an object between the drive member and the upper portion of the body.

19. The drive member protector of claim 18 wherein the upper portion of the body includes a channel comprising the recess, the raised portions, and a bottom surface extending between the raised portions.

20. The drive member protector of claim 18 wherein the raised portions include flat uppermost surfaces.

21. The drive member protector of claim 20 wherein the raised portions have side surface portions on either side of the recess and upper, corner junctures between the side surfaces portions and the flat uppermost surfaces.

22. The drive member protector of claim 18 wherein the recess has a length for extending between the rollers orthogonal to axes of rotation of the rollers and a width perpendicular to the length that is shorter than the length of the recess.

23. The drive member protector of claim 18 wherein the recess has a width in a lateral direction for extending along axes of rotation of the adjacent rollers that is larger than a diameter of the drive member; and

wherein the raised portions each have a raised portion width in the lateral direction that is the same or greater than the diameter of the drive member.

24. The drive member protector of claim 18 wherein the raised portions each have a raised portion width in a lateral direction for extending along axes of rotation of the adjacent rollers; and

wherein the recess has a recess width in the lateral direction that is greater than a sum of the raised portion widths.

25. The drive member protector of claim 18 wherein the body includes a protrusion configured to extend into a drive member-receiving groove of one of the adjacent rollers and maintain the body at a predetermined location along the rollers.

26. The drive member protector of claim 18 wherein the body includes a pair of lower protector members configured to extend along either side of a lower run of the drive member with the body positioned in the gap.

27. The drive member protector of claim 18 wherein the body includes an upstream leg portion configured to extend along one of the rollers and a downstream leg portion spaced from the upstream leg portion configured to extend along the other roller.

28. A roller conveyor system comprising:

an upstream roller having an upstream groove and a downstream roller having a downstream groove, the upstream and downstream rollers rotatable to convey an object in a downstream longitudinal direction;

a gap between the upstream and downstream rollers;

a drive member engaged in the upstream and downstream grooves of the upstream and downstream rollers and having an upper run that travels in the downstream longitudinal direction and a lower run that travels in an upstream longitudinal direction;

a gap blocker supported by the upstream and downstream rollers in the gap; and

engaging portions of the gap blocker and at least one of the upstream and downstream grooves that resist lateral movement of the gap blocker along the upstream and downstream rollers.

29. The roller conveyor system of claim 28 wherein the engaging portions include surfaces of the gap blocker and the at least one of the upstream and downstream grooves that overlap in a lateral direction.

30. The roller conveyor system of claim 28 wherein the engaging portions of the gap blocker and the at least one of the upstream and downstream grooves includes engaging portions of the gap blocker and both of the upstream and downstream grooves.

31. The roller conveyor system of claim 28 wherein the engaging portions include a protrusion of the gap blocker extending into the at least one of the upstream and downstream grooves.

32. The roller conveyor system of claim 28 wherein the drive member is a drive band and the upper run of the drive band travels from the upstream groove of the upstream roller to the downstream groove of the downstream roller; and

wherein the gap blocker includes a channel below the upper run.

33. The roller conveyor system of claim 28 wherein the gap blocker includes a channel below the upper run of the drive member; and

wherein the engaging portions of the gap blocker and the at least one of the upstream and downstream grooves maintain the gap blocker in a predetermined lateral location along the rollers so that the channel remains below the upper run of the drive member.

34. The roller conveyor system of claim 28 wherein the gap blocker includes an upper blocking portion extending longitudinally across the gap, the upper blocking portion having a recess below the upper run of the drive member and raised portions extending along either side of the recess.

35. The roller conveyor system of claim 28 wherein the gap blocker comprises:

raised portions extending along either side of the upper run of the drive member having upper surfaces;

a clearance surface below the upper run of the drive member;

corner junctures between upper surfaces of the raised portions and the clearance surface; and

the raised portions are sized to keep a size of a space between the corner junctures and the upper run of the drive member to a minimum to keep objects from fitting into the space.

36. The roller conveyor system of claim 28 wherein the upstream groove includes a pair of upstream grooves, the downstream groove includes a pair of downstream grooves, and the drive member includes a pair of drive members each having an upper run; and

wherein the gap blocker includes a channel below the upper runs of the drive members and raised portions extending along opposite sides of the channel.

37. The roller conveyor system of claim 28 wherein the drive member comprises an o-ring of resilient material.

38. The roller conveyor system of claim 28 wherein the drive member comprises a drive band.

39. The roller conveyor system of claim 28 wherein the upstream and downstream rollers are rotatable around respective axes that remain stationary while the upstream and downstream rollers rotate to convey an object.

40. The roller conveyor system of claim 28 wherein the upstream and downstream rollers are rotatably mounted to a stationary conveyor frame such that the upstream and downstream rollers are rotatable to convey an object while the conveyor frame remains stationary.

41. A gap blocker for a roller conveyor having upstream and downstream rollers for conveying an object in a downstream longitudinal direction and a gap between the upstream and downstream rollers, the gap blocker comprising:

a body configured to be supported in the gap by the upstream and downstream rollers as the upstream and downstream rollers rotate during operation of the roller conveyor;

an upper blocking portion of the body to inhibit the object from falling through the gap;

a plurality of laterally spaced upstream lower members of the body having upstream lower free end portions to be positioned below a narrowest portion of the gap for keeping the body in the gap;

wherein at least one of the upstream lower free end portions has an upstream recessed portion that is recessed above a lowermost end of one of the other upstream lower free end portions to provide clearance for a drive member;

a plurality of laterally spaced downstream lower members of the body having downstream lower free end portions to be positioned below the narrowest portion of the gap for keeping the body in the gap; and

wherein at least one of the downstream lower free end portions has a downstream recessed portion that is recessed above a lowermost end of one of the other downstream lower free end portions to provide clearance for the drive member.

42. The gap blocker of claim 41 wherein the body has a unitary, one-piece construction.

43. The gap blocker of claim 41 wherein the body includes a gap that extends longitudinally from the upstream lower members to the downstream lower members and that extends continuously perpendicular to the longitudinal downstream direction from the upper blocking portion to the upstream and downstream lower free end portions.

44. The gap blocker of claim 41 wherein the upstream lower members include a plurality of upstream lower members having upstream lower free end portions that are laterally aligned; and

wherein the downstream lower members include a plurality of downstream lower members having downstream lower free end portions that are laterally aligned.

45. The gap blocker of claim 44 wherein the at least one of the upstream lower free end portions is laterally misaligned with the upstream lower free end portions of the plurality of upstream lower members; and

wherein the at least one of the downstream lower free end portions is laterally misaligned with the downstream lower free end portions of the plurality of downstream lower members.

46. The gap blocker of claim 41 wherein the upstream lower members include an upstream middle lower member and upstream, side lower members on opposite sides of the upstream middle lower member;

wherein the upstream, side lower members have laterally aligned upstream lower free end portions;

wherein the downstream lower members include a downstream middle lower member and downstream, side lower members on opposite sides of the downstream middle lower member; and

wherein the downstream, side lower members have laterally aligned downstream lower free end portions.

47. The gap blocker of claim 46 wherein the upstream middle lower member includes the at least one of the upstream lower free end portions; and

wherein the downstream middle lower member includes the at least one of the downstream lower free end portions.

48. The gap blocker of claim 41 wherein the upstream recessed portion is higher than the lowermost end of the one of the other upstream lower free end portions; and

wherein the downstream recessed portion is higher than the lowermost end of the one of the other downstream lower free end portions.

49. The gap blocker of claim 41 wherein the at least one upstream lower member including the upstream recessed portion is shorter than the upstream lower member including the one of the other upstream lower free end portions; and

wherein the at least one downstream lower member including the downstream recessed portion is shorter than the downstream lower member including the one of the other downstream lower free end portions.

50. The gap blocker of claim 41 wherein the at least one upstream lower free end portion is longitudinally aligned with the at least one downstream lower free end portion.

51. The gap blocker of claim 41 wherein the upstream lower members include upstream, side lower members and an upstream middle lower member between the upstream, side lower members; and

wherein the upstream, middle lower member includes the at least one upstream lower free end portion having the upstream recessed portion that is above the lowermost ends of the upstream lower free end portions of the upstream, side lower members.

52. The gap blocker of claim 51 wherein the upstream, side lower members are immediately adjacent the upstream middle lower member; and

wherein the downstream, side lower members are immediately adjacent the downstream middle lower member.

53. The gap blocker of claim 51 wherein the downstream lower members include downstream, side lower members and a downstream middle lower member between the downstream, side lower members; and

wherein the downstream middle lower member includes the at least one downstream lower free end portion having the downstream recessed portion that is above the lowermost ends of the downstream lower free end portions of the downstream, side lower members.

54. The gap blocker of claim 41 wherein the upper blocking portion of the body includes a recess to be positioned below an upper run of the drive member; and

raised portions of the upper blocking portion extending along either side of the recess.

55. The gap blocker of claim 54 wherein the raised portions include a first raised portion having a first lateral width and a second raised portion having a second lateral width; and

wherein the recess has a third lateral width that is larger than either of the first lateral width and the second lateral width.

56. The gap blocker of claim 41 wherein the upper blocking portion of the body includes a recess to receive an upper run of the drive member; and

wherein the upstream recessed portion and the downstream recessed portion are below the recess to provide clearance for a lower run of the drive member.

57. The gap blocker of claim 41 wherein the upper blocking portion includes an upstream outboard portion and a downstream outboard portion configured to slidingly contact the upstream and downstream rollers as the upstream and downstream rollers rotate during operation of the roller conveyor.

58. The gap blocker of clam 41 wherein the upstream recessed portion extends an entire lateral width of the corresponding upstream lower free end portion; and

wherein the downstream recessed portion extends an entire lateral width of the corresponding downstream lower free end portion.

59. The gap blocker of claim 41 wherein the body includes upstream lateral spacings laterally spacing adjacent upstream lower members and downstream lateral spacings laterally spacing adjacent downstream lower members; and

wherein each of the upstream lateral spacings is longitudinally aligned with a corresponding one of the downstream lateral spacings.

60. The gap blocker of claim 41 wherein at least one of the upstream and downstream lower members is resilient.

61. The gap blocker of claim 41 wherein the upper blocking portion is configured to be supported in the gap above the narrowest portion of the gap by the rollers.