CLAIMS

1. A drive sprocket comprising a plurality of teeth for meshing with a drive member to transmit rotary motion, the drive member including a plurality of engagement pockets engaging the teeth of the drive sprocket, wherein each tooth has a tooth profile defined by a first side comprising a first engagement surface and an opposite second side comprising a second engagement surface, which engagement surfaces are configured such that when driven, a tooth meshes to the engagement pocket at a first contact location on the first engagement surface and also at a second contact location on the second engagement surface, wherein the first contact location is radially offset from the second contact location.

2. A drive sprocket as claimed in claim 1, wherein each tooth has a front face and a back face, the shape of which faces being defined by the first and second sides, wherein the shape of each face is symmetrical about a radial axis of the tooth, and the sides of the faces are defined at least partially by two arcs.

3. A drive sprocket according to claim 2, wherein the two arcs each have a radius of R, the centres of the arcs being at a distance x from one another, and at a perpendicular distance, y, from the centre of the drive sprocket, and wherein the centre of each arc is at $\pm x/2, y$.

4. A drive sprocket according to any one of the preceding claims, wherein adjacent teeth are spaced apart from one another to define a connecting portion of the sprocket.

5. A transmission system comprising a drive sprocket according to any one of the preceding claims, further comprising a drive member, which drive member is adapted to mesh with the drive sprocket.

6. A transmission system as claimed in claim 5, wherein the drive member comprises a plurality of engagement pockets, each of which engagement pockets comprising a first engaging surface and a second engaging surface spaced apart from the first engaging surface, the first and second engaging surfaces forming an engagement surface pair, which pair is rotatable about a rotational axis, wherein adjacent engagement pockets are connected to one another by a connecting member.

7. A transmission system as claimed in claim 6, wherein adjacent engagement pockets are connected to one another by a primary link, which primary link is rotatable about the rotational axis of the engagement surface pair.

8. A transmission system as claimed claim 7, wherein each primary link is rotatable about the rotational axis of each adjacent engagement pocket.

9. A transmission system according claim 7 or claim 8, comprising a plurality of first primary links which are coplanar with one another and are pivotally connected to one another at first and second pivot points, which pivot points are spaced apart from one another such that adjacent first primary links are pivotable about the axis of rotation of each adjacent engagement pocket.

10. A transmission system as claimed in claim 9, comprising a plurality of second primary links coplanar with one another and pivotally connected to one another at first and second pivot points, which pivot points are spaced apart from one another such that adjacent second primary links are pivotable about the axis of rotation of each adjacent engagement pocket, wherein the first primary links are connected to the second primary links such the first and second primary links are substantially parallel to one another, and the first pivot points of the first links are coaxial with the second pivot points of the second links, and the second pivot points of the first links are coaxial with the first pivot points of the second links.

11. A transmission system as claimed in any one of claims 7 to 10, wherein each engagement pocket comprises first and second transverse members, each having a first end and a second end, the first and second transverse members being spaced apart from one another, wherein the first and second engaging surfaces are formed on the first and second transverse members respectively.

12. A transmission system as claimed in claim 11, wherein each engagement pocket comprises a secondary link connecting the first and second transverse members, wherein the secondary links are coplanar with one another.

13. A transmission system as claimed in claim 12, wherein the secondary links are parallel with the primary links, and the transverse members are substantially perpendicular to the primary and secondary links.

14. A transmission system as claimed in claim 12 or claim 13, wherein each engagement pocket comprises a first secondary link positioned at, or close to the first ends of the first and second transverse members, and a second secondary link positioned at, or close to the second ends of the transverse members, where in the first and second secondary links are parallel with one another.

15. A transmission system as claimed in claim 14, wherein each engagement pocket comprises a first set of first and second primary links which are proximate the first secondary links, and a second set of primary and secondary links with are proximate the second secondary links.

16. A transmission system as claimed in claim 15, wherein the first and second transverse members each have a radius *r*, wherein the distance between the first and second members of an engagement pocket is *p2*, and the distance between first and second pivot points of a primary link is *p*.

17. A drive member forming part of a transmission system as claimed in any one of claims 5 to 16.

18. A power transmission drive member adapted to mesh with a drive sprocket to transmit rotary motion, the drive member comprising a plurality of engaging mechanisms, each comprising an engaging body comprising an engagement pocket adapted to engage with the drive sprocket, each of which engagement pockets comprising a first engaging surface and a second engaging surface spaced apart from the first engaging surface, the first and second engaging surfaces forming an engaging surface pair, which pair is rotatable about an engaging mechanism rotational axis, wherein the power transmission drive member comprises a carrier, which carrier is articulated and is adapted to support the plurality of engaging mechanisms.

19. A power transmission drive member as claimed in claim 18 wherein the first and second engaging surfaces are positioned symmetrically relative to the rotational axis of a respective engaging body.

20. A power transmission drive member as claimed in claim 18 or claim 19 wherein the engaging surfaces are configured such that when driven, a tooth of the sprocket meshes to the engagement pocket at a first contact location on the first engaging surface, and also at a second contact location on the second engaging surface.

21. A power transmission drive member as claimed in claim 20 wherein the first contact location is radially offset from the second contact location during use.

22. A power transmission drive member as claimed in one of claims 18 to 21 wherein the first and second engaging surfaces of each engaging body are formed on first and second pins respectively.

23. A power transmission drive member as claimed in any one of claims 18 to 22 wherein each engaging mechanism comprises two engaging bodies, which engaging bodies are spaced apart from one another.

24. A power transmission drive member as claimed in any one of claims 18 to 23 wherein each engaging mechanism comprises a connecting member having a first end and an opposite second end, and attachable to one engaging body at the first end, to the other engaging body at the second end, and extending colinearly with the rotational axis of the respective engaging mechanism wherein each engaging body of a respective engaging mechanism comprises a front face and an opposite back face, wherein the engaging surfaces of each engaging body extend from the front face of a respective engaging body, and the connecting member extends from the back face of one engaging body to the back face of the other engaging body , which connecting member is adapted to enable connection of a respective engaging mechanism to the carrier.

25. A power transmission drive member as claimed in Claim 24 wherein the connecting member is attached to each engaging body by means of a press fit with the engaging body.

26. A power transmission drive member as claimed in any one of claims 18 to 25 wherein each engaging body comprises a receiving portion adapted to receive the connecting member, which receiving portion comprises an aperture, the centre of which is coaxial with the rotational axis of a respective engaging mechanism

27. A power transmission drive member as claimed in any one of claims 24 to 26 wherein the carrier comprises hollow pins extending transversely at least partially across the carrier at spaced apart intervals along the length of the carrier, wherein each connecting member extends through a hollow pin to thereby connect the engaging mechanisms to the carrier.

28. A power transmission drive member as claimed in claim 18 wherein the carrier comprises a chain formed from links, wherein each link comprises a body portion and first and second legs extending from the body portion to define a space between the legs and the body portion, wherein each leg comprises a hollow pin receiving portion, wherein the hollow pin receiving portion of a first leg of a link is coaxial with the rotational axis of a first engaging mechanism, and the hollow pin receiving portion of the second leg of the link is coaxial with the rotational axis of a second, adjacent, engaging mechanism, and wherein each connecting member is adapted to extend through a respective hollow pin and engaging body, to thereby link the engaging bodies to the links, such that each engaging body is rotatable about its rotational axis, the space of each link providing space for such rotation.

29. A power transmission drive member as claimed in any one of claims 18 to 28 comprising a chain having inner links and outer links, wherein the inner links of the chain each comprise a composite inner link formed from a plurality of link plates.

30. A power transmission drive member as claimed in any one of claims 18 to 29 wherein each engaging mechanism comprises first and second extension members, which extension members are spaced apart from, and coaxial with one another, and each has first and second end portions, wherein the extension member extends across the width of the engaging mechanism and through each engaging body such that the first and second end portions of each extension member extend from the first face of each engaging body, away from the carrier to form a pin, wherein the first engaging surfaces of each engaging body are formed on the first and second end portions respectively of the first extension member, and the second engaging surfaces of each engaging body are formed on the first and second end portions respectively of the second extension member.

31. A power transmission drive member as claimed in any one of claims 18 to 30 wherein the carrier comprises angle rotation limiters providing stops formed on the carrier.

32. An engaging mechanism forming part of a power transmission drive member as claimed in any one of claims 18 to 31.

33. A power transmission system comprising a power transmission drive member as claimed in any one of claims 18 to 31, further comprising a drive sprocket, the power transmission drive member being adapted to engage with the drive sprocket.

34. A drive sprocket comprising a plurality of teeth for meshing with a drive member to transmit rotary motion, the drive member including a plurality of engagement pockets engaging the teeth of the drive sprocket, wherein each tooth has a tooth profile defined by a first side comprising a first engagement surface and an opposite second side comprising a second engagement surface, which engagement surfaces are configured such that when driven, a tooth meshes to the engagement pocket at a first contact location on the first engagement surface and also at a second contact location on the second engagement surface, the first contact location being radially offset from the second contact location, and wherein each tooth has a front face and a back face, the shape of which faces being defined by the first and second sides such that the shape of each face is symmetrical about a radial axis of the tooth, and the first side of each face is defined at least partially by a first face arc, and the second side of each face is defined at least partially by a second face arc, wherein the distance between the centre of the first face arc and the centre of the second face arc of each tooth is substantially the same as the distance between the centre of the first face arc of a first tooth and the centre of the second face arc of an adjacent tooth.

35. A drive sprocket as claimed in claim 34 wherein the first face arc of each tooth comprises a base portion of the first side of the said tooth, and the second face arc of each tooth forms a base portion of the second side of the respective tooth, wherein the first and second face arcs each comprise a roller seating curve.

36. A drive sprocket as claimed in claim 34 or claim 35 wherein each first and second side comprises a second portion comprising a convex arc extending from a respective roller seating curve towards a tip portion of a respective tooth.

37. A drive sprocket as claimed in any one of the claims 34 to 36 further comprising a supporting curve extending from the roller seating curve of a first tooth towards the roller seating curve of an adjacent tooth.

38. A transmission system comprising a drive sprocket according to any one of claims 34 to 37 further comprising a drive member, which drive member is adapted to mesh with the drive sprocket.

39. A transmission system as claimed in claim 38 wherein the drive member comprises a plurality of engagement pockets, each of which engagement pockets comprising a first engaging surface and a second engaging surface spaced apart from the first engaging surface.

40. A transmission system as claimed in claim 39 wherein the drive member comprises a roller chain and wherein the engagement pockets are defined between adjacent rollers forming the roller chain.

41. A transmission system as claimed in claim 40 wherein the roller chain has a pitch p, and the distance between the centre of the first face arc and the centre of the second face arc of each tooth, and the distance between the centre of the first face arc of a first tooth and the centre of the second face arc of an adjacent tooth is substantially equal to p.

42. A transmission system as claimed in claim 40 or claim 41 wherein the radius of each roller forming the roller chain is substantially equal to, or slightly smaller than, the radius of each arc forming the first and second faced arcs.

43. A drive member forming part of a transmission system as claimed in any one of claims 38 to 42.

44. A transmission system comprising a drive sprocket and a drive member adapted to mesh with the drive sprocket, the drive sprocket comprising a plurality of teeth for meshing with the drive member to transmit rotary motion and the drive member comprising a plurality of engagement pockets adapted to engage the teeth of the drive sprocket,

wherein each tooth of the drive sprocket has a tooth profile defined by a first side comprising a first engagement surface and an opposite second side comprising a second engagement surface, which engagement surfaces are configured such that when driven, a tooth meshes to an engagement pocket at a first contact location on the first engagement surface and also at a second contact location on the second engagement surface, the first contact location being radially offset from the second contact location,

wherein the drive member comprises a roller chain comprising a plurality of spaced apart rollers, each roller being spaced apart from adjacent rollers by a predetermined distance, and connected to an adjacent roller by a rigid connecting member extending between two adjacent rollers whereby the engagement pockets are defined between adjacent rollers,

wherein, a first engagement pocket is formed by first and second rollers which are adjacent to one another, a second engagement pocket is formed by the first roller and a third roller, and a third engagement pocket is formed by the second roller and a

fourth roller, the third roller being adjacent to the first roller, and the fourth roller being adjacent to the second roller,

and wherein an angle formed between a connecting member connecting the first and second rollers, and a connecting member connecting the first and third rollers, comprises a first articulation angle, and an angle formed between the connecting member connecting the first and second rollers, and a connecting member connecting the second and fourth rollers comprises a second articulation angle,

wherein, the magnitude of the first articulation angle formed when the first second and third rollers are all in contact with a tooth is different to the magnitude of the second articulation angle formed when the first second and fourth rollers are all in contact with a tooth.

45. A transmission system according to Claim 44 wherein the drive member comprises a plurality of articulation points, and the articulation angles are defined at articulation points.

46. A transmission system according to Claim 44 or Claim 45 wherein the first roller comprises a load bearing roller and the second roller comprises a supporting roller.

47. A transmission system according to any one claims 44 to 46 wherein the magnitude of the first articulation angle is greater than the magnitude of second articulation angle.

48. A transmission system according to any one of claims 44 to 47 wherein magnitude of every other articulation angle is substantially the same.

49. A transmission system according to any one of the claims 44 to 48 wherein the shape of each tooth face is symmetrical about a radial axis of the tooth.

50. A transmission system according to any one of claims 44 to 49 wherein the first side of each face is defined at least partially by a first face arc, and the second side of each face is defined at least partially by a second face arc.

51. A transmission system according to any one of claims 44 to 50 wherein the first face arc forms a base portion of the first side of each tooth, and the second face arc forms a base portion of the second side of each tooth, wherein the first and second face arcs each comprise a roller seating curve.

52. A transmission system according to Claim 51 wherein the roller seating curve is adapted to receive a roller which is adapted to mesh with the sprocket.

53. A transmission system according to any one of claims 44 to 52 wherein each first and second side comprises a second portion comprising a convex arc extending from a respective roller seating curve towards a tip portion of a respective tooth.

54. A transmission system according to any one of claims 44 to 52 comprising a supporting curve extending from the roller seating curve of a first tooth towards a roller seating curve of an adjacent tooth.

55. A transmission system according to any one of claims 44 to 54 wherein the roller chain comprises a plurality of inner links, each of which serves to connect two rollers to form a roller pair, and a plurality of outer links, each of which serves to connect roller pairs to one another to form the roller chain, such that a space is defined between inner surfaces of facing inner links, and also between inner surfaces of facing outer links wherein each tooth of the sprocket tooth has a width which is the same as, or slightly less than the distance between inner surfaces of facing outer links, and greater than the distance between inner surfaces of facing inner links.

56. A transmission system according to claim 55 wherein each tooth of the sprocket comprises a first width which is the same as or slightly less than the distance between inner surfaces of facing inner links, and a second width that is the same as or slightly less than the distance between the inner surfaces of facing outer links.

57. A sprocket forming part of a transmission system according to any one of claims 44 to 56.

CLAIMS

1. A drive sprocket comprising a plurality of integrally formed teeth for meshing with a drive member to transmit rotary motion, the drive member including a plurality of engagement pockets engaging the teeth of the drive sprocket, in which each tooth has a tooth profile defined by a first side comprising a first engagement surface and an opposite second side comprising a second engagement surface, which engagement surfaces are configured such that when driven, a tooth meshes to the engagement pocket at a first contact location on the first engagement surface and also at a second contact location on the second engagement surface, in which the first contact location is radially offset from the second contact location.

2. A drive sprocket according to Claim 1, in which each tooth has a front face and a back face, the shape of which faces being defined by the first and second sides, in which the shape of each face is symmetrical about a radial axis of the tooth, and the sides of the faces are defined at least partially by two arcs.

3. A drive sprocket according to Claim 1 or 2, in which adjacent teeth are spaced apart from one another to define a connecting portion of the sprocket.

4. A drive sprocket according to Claim 1, in which each tooth has a front face and a back face, the shape of which faces being defined by the first and second sides such that the shape of each face is symmetrical about a radial axis of the tooth, and the first side of each face is defined at least partially by a first face arc, and the second side of each face is defined at least partially by a second face arc, in which the distance between the centre of the first face arc and the centre of the second face arc of each tooth is substantially the same as the distance between the centre of the first face arc of a first tooth and the centre of the second face arc of an adjacent tooth.

5. A drive sprocket according to Claim 4, in which the first face arc of each tooth comprises a base portion of the first side of the tooth, and the second face arc of each tooth forms a base portion of the second side of the respective tooth, in which the first and second face arcs each comprise a roller seating curve.

6. A drive sprocket according to Claim 4 or 5, in which each first and second side comprises a second portion comprising a convex arc extending from a respective roller seating curve towards a tip portion of a respective tooth.

7. A drive sprocket according to any of Claims 4 to 6, further comprising a supporting curve extending from the roller seating curve of a first tooth towards the roller seating curve of an adjacent tooth.

8. A transmission system comprising a drive sprocket according to any of Claims 4 to 7 and a drive member adapted to mesh with the drive sprocket.

9. A transmission system according to Claim 8, in which the drive member comprises a roller chain and adjacent rollers forming the roller chain define a plurality of engagement pockets, each of which engagement pockets comprising a first engaging surface and a second engaging surface spaced apart from the first engaging surface, preferably the roller chain has a pitch p, and the distance between the centre of the first face arc and the centre of the second face arc of each tooth, and the distance between the centre of the first face arc of a first tooth and the centre of the second face arc of an adjacent tooth is substantially equal to p.

10. A transmission system comprising a drive sprocket according to Claim 1 and a drive member adapted to mesh with the drive sprocket,

in which the drive member comprises a roller chain comprising a plurality of spaced apart rollers, each roller being spaced apart from adjacent rollers by a predetermined distance, and connected to an adjacent roller by a rigid connecting member extending between two adjacent rollers whereby the engagement pockets are defined between adjacent rollers,

in which a first engagement pocket is formed by first and second rollers which are adjacent to one another, a second engagement pocket is formed by the first roller and a third roller, and a third engagement pocket is formed by the second roller and a fourth roller, the third roller being adjacent to the first roller, and the fourth roller being adjacent to the second roller,

and in which an angle formed between a connecting member connecting the first and second rollers, and a connecting member connecting the first and third rollers, comprises a first articulation angle, and an angle formed between the connecting member connecting the first and second rollers, and a connecting member connecting the second and fourth rollers comprises a second articulation angle,

in which the magnitude of the first articulation angle formed when the first second and third rollers are all in contact with a tooth is different to the magnitude of the second articulation angle formed when the first second and fourth rollers are all in contact with a tooth.

11. A transmission system according to Claim 10, in which the drive member comprises a plurality of articulation points, and the articulation angles are defined at articulation points.

12. A transmission system according to Claim 10 or 11, in which the first roller comprises a load bearing roller and the second roller comprises a supporting roller.

13. A transmission system according to Claim 10, 11 or 12, in which the magnitude of the first articulation angle is greater than the magnitude of second articulation angle.

14. A transmission system according to any of Claims 10 to 13, in which magnitude of every other articulation angle is substantially the same.

15. A transmission system according to any of Claims 10 to 14, in which the roller chain comprises a plurality of inner links, each of which serves to connect two rollers to form a roller pair, and a plurality of outer links, each of which serves to connect roller pairs to one another to form the roller chain, such that a space is defined between inner surfaces of facing inner links, and also between inner surfaces of facing outer links, in which each tooth of the sprocket tooth has a width which is the same as, or slightly less than the distance between inner surfaces of facing outer links, and greater than the distance between inner surfaces of facing inner links; and, optionally, each tooth of the sprocket comprises a first width which is the same as or slightly less than the distance between inner surfaces of facing inner links, and a second width that is the same as or slightly less than the distance between the inner surfaces of facing outer links.