

CLAIMS:

1. A shaving unit (12) for use in a shaving device, the shaving unit (12) comprising:
- a base portion (20) comprising a coupling structure (44) by means of which the shaving unit is releasably couplable to a main housing (15) of the shaving device;
 - 5 at least two hair-cutting units (13); and
 - a supporting member (26) centrally arranged between the at least two hair-cutting units (13) and having a central axis (15),
 - wherein each hair-cutting unit (13) is connected to the supporting member (26) and comprises:
 - 10 an external cutting member (13a) having a plurality of hair-entry openings;
 - an internal cutting member which is rotatable relative to the external cutting member;
 - a cutting unit housing (11) supporting the external and internal cutting members of the hair-cutting unit (13) and accommodating an individual hair-collecting chamber of the hair-cutting unit which is separate from the hair-collecting chambers of the other hair-cutting units; and
 - 15 a pivot axis (50) about which the cutting-unit housing is pivotable relative to the supporting member (26) independently from the cutting-unit housings of the other hair-cutting units,
 - 20 characterized in that the shaving unit (12) further comprises:
 - a linear guiding structure (22,24) enabling the supporting member (26) to linearly move relative to the base portion (20) in a movement direction (17) parallel to the central axis (15) of the supporting member (26) between a first, retracted, position and a
 - 25 second, extended, position; and
 - a spring member (30) for biasing the supporting member (26) away from the base portion (20) in the movement direction.

2. A shaving unit as claimed in claim 1, further comprising a drive unit for driving the internal cutting members of the hair-cutting units into rotation, and wherein the drive unit comprises, for each of the hair-cutting units, an individual drive spindle (40) which is rotationally supported by the base portion (20) and coupled to the internal cutting member
5 of the respective hair-cutting unit (13).

3. A shaving unit as claimed in claim 2, wherein the drive unit is releasably couplable to a driving actuator (16) in the main housing of the shaving device by means of a single driven coupling member (14) which is accommodated in the coupling structure (44),
10 and wherein the base portion (20) comprises a transmission unit for coupling the single driven coupling member to each of the individual drive spindles (40).

4. A shaving unit as claimed in any one of claims 1 to 3, wherein for each hair-cutting unit:
15 the internal cutting member comprises a plurality of cutting elements each having a cutting edge;
during rotation of the internal cutting member, the cutting edges follow an annular cutting path (13c) about an axis of rotation (13b) of the internal cutting member; and
seen in an axial direction relative to the central axis (15), the pivot axis (50) is
20 located between the central axis (15) and the annular cutting path (13c).

5. A shaving unit (12) as claimed in any one of claims 1 to 4, wherein the linear guiding structure (22, 24) comprises:
a guide shaft (22) mounted in a fixed position to the base portion and having a
25 shaft axis (22a) extending parallel to the movement direction (17) of the supporting member;
a set of guide elements (24), each mounted in a fixed position to the base portion and each being radially spaced from the shaft axis of the guide shaft (22);
a guide bush (27) mounted in a fixed position to the supporting member (26) and arranged for sliding motion over the guide shaft (22) parallel to the shaft axis for
30 enabling linear movement of the supporting member (26) relative to the base portion in the movement direction (17); and
a set of guide members (28), each mounted in a fixed position to the supporting member and each being arranged for engaging a respective one of the set of guide elements (24) to allow linear movement of the supporting member (26) relative to the base

portion in the movement direction (17);

wherein, seen in the movement direction (17), the guide shaft (22) and the guide bush (23) are arranged at a distance from the set of guide elements (24) and the set of guide members (28).

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6. A shaving unit as claimed in claim 5, wherein the set of guide members (28) are each arranged for engaging a respective one of the set of guide elements (24) to also allow rotation of the supporting member about axes (22b) in a plane perpendicular to the central axis (15).

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7. A shaving unit as claimed in claim 6, wherein the guide bush (27) and the guide shaft (22) mutually engage such as to allow rocking of the guide bush relative to the guide shaft (22) and thereby to allow said rotation of the supporting member about axes in a plane perpendicular to the central axis.

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8. A shaving unit (12) as claimed in claim 6 or 7, wherein the guide elements (24) each comprise a channel (25) extending parallel to the movement direction (17), and the guide members (28) each comprise a curved projection located within the channel (25) of a respective one of the guide elements (24), wherein each curved projection is arranged in the associated channel (25) such that motion of the curved projection in tangential directions relative to the central axis (15) is prevented.

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9. A shaving unit (12) as claimed in claim 8, wherein the projections (28) each comprise a ball.

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10. A shaving unit (12) as claimed in claim 8 or 9, wherein each channel (25) is formed between opposing side surfaces of a pair of guiding walls (32,34), and at least one guiding wall has a stop element (36), and wherein the supporting member (26) comprises an abutment element (38) for engagement with the stop element (36) to define the second, extended, position of the supporting member relative to the base member.

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11. A shaving unit (12) as claimed in any one of claims 5 to 10, wherein the guide elements (24) are located in a bottom part of the base portion (20) and the guide bush (22) is

positioned centrally between the hair-cutting units at a distance, in the movement direction, from the bottom part of the base portion.

12. A shaving unit (12) as claimed in any one of claims 5 to 11, comprising a set
5 of at least three guide elements (24) arranged at regular angular intervals about the central axis.

13. A shaving unit (12) as claimed in claim 12, comprising at least three rotary
10 hair-cutting units (13), and comprising a transmission unit which comprises at least three gear wheels (42), each gear wheel (42) being associated with a respective drive spindle for a respective one of the rotary hair-cutting units, and the gear wheels (42) being disposed around the central axis (15), wherein each guide element is positioned between a respective one of adjacent pairs of the gear wheels (42).

14. A shaving unit (12) as claimed in any one of claims 5 to 13, wherein the base
15 portion comprises a lower housing (21a) and a frame (21b) attached to the lower housing (21a), wherein the frame comprises a receiving channel (23) for receiving the guide shaft (22), and also comprises the set of guide elements (24).

15. A shaving unit (12) as claimed in claim 14, wherein the set of guide elements
20 (24) are arranged at feet of the frame (21b) by means of which the frame connects to the lower housing (21a), and the guide shaft (22) projects out of the receiving channel (23) beyond a top of the frame (21b).

16. An electric shaver comprising:
25 a main housing (15) which houses an electric motor; and
a shaving unit (12) as claimed in any one of claims 1 to 15 coupled to the main housing (15).