

CLAIMS:

1. A hair cutting appliance comprising:
 - a support structure (60) accommodating a drive system (64);
 - at least one cutting unit (17) supported by the support structure (60) and comprising an external cutting member (18) having a plurality of hair entry openings (54),
5 and an internal cutting member (19) rotatable relative to the external cutting member (18);
and
 - at least one drive spindle (24, 24a) rotatable about an axis of rotation (35) and having a first spindle part (26) arranged to be driven by the drive system (64) and a second spindle part (30) arranged to be coupled to the internal cutting member (19), the first and
10 second spindle parts (26, 30) being displaceable relative to each other in an axial direction parallel to the axis of rotation (35);
wherein the internal cutting member (19) comprises a plurality of cutting elements (52), a first coupling element (56), and a carrier (58) carrying the cutting elements (52) and the first coupling element (56);
15 wherein the second spindle part (30) comprises a second coupling element (34) which is coupled to the first coupling element (56) for transmitting, during operation, a driving torque about the axis of rotation (35) from the drive spindle (24, 24a) to the internal cutting member (19); and
wherein one of the first and second spindle parts (26, 30) comprises an abutment element
20 (36) and the other of the first and second spindle parts (26, 30) comprises an abutment surface (38) arranged to cooperate with the abutment element (36) for transmitting, during operation, the driving torque from the first spindle part (26) to the second spindle part (30);
characterized in that the abutment surface (38) is arranged at an angle α relative to a line extending parallel to the axis of rotation (35), wherein $0^\circ < \alpha < 90^\circ$ such that a transmission
25 of the driving torque from the first spindle part (26) to the second spindle part (30) via the abutment element (36) and the abutment surface (38) results in a force exerted by the first spindle part (26) on the second spindle part (28) having a component parallel to the axis of rotation (35) and directed towards the internal cutting member (19), wherein the first and

second coupling elements (56, 34) are configured to transmit said component from the second spindle part (30) to the internal cutting member (19).

2. The hair cutting appliance as claimed in claim 1, characterized in that the
5 abutment surface (38) extends helically relative to the axis of rotation (35).
3. The hair cutting appliance of claim 1 or 2, characterized in that the abutment element (36) comprises a boss.
- 10 4. The hair cutting appliance as claimed in any one of the preceding claims, characterized in that the drive spindle (24, 24a) comprises a mechanical spring (46) arranged to bias the second spindle part (30) relative to the first spindle part (26) in a direction towards the internal cutting member (19).
- 15 5. The hair cutting appliance as claimed in any of the preceding claims, characterized in that the first spindle part (26) comprises a cavity (50), wherein the second spindle part (30) is partially received in said cavity (50) and displaceably guided by said cavity (50) so as to be displaceable relative to the first spindle part (26) in the axial direction.
- 20 6. The hair cutting appliance as claimed in claim 5, characterized in that the mechanical spring (46) is arranged in said cavity (50) for exerting a biasing force on the second spindle part (30) directed towards the internal cutting member (19).
7. The hair cutting appliance as claimed in any one of the preceding claims,
25 characterized in that the angle (α) is at least 3°, preferably at least 5°, preferably at least 20°.
8. The hair cutting appliance as claimed in any one of the preceding claims, characterized in that the angle (α) is at most 87°, preferably at most 85°, preferably at most 70°.
- 30 9. The hair cutting appliance as claimed in any one of the preceding claims, characterized in that the cutting unit (17) is moveably suspended relative to the support structure (60) by means of a suspension structure (62) such that, as a result of a motion of the cutting unit (17) relative to the support structure (60) allowed by the suspension structure

(62), the first coupling element (56) is displaced in the axial direction whereby the first and second spindle parts (26, 30) are displaced relative to each other in the axial direction, and wherein the angle (α) of the abutment surface (38) varies in the axial direction.

- 5 10. The hair cutting appliance as claimed in claim 9, characterized in that the cutting unit (17) comprises a supporting member (68) for supporting the external cutting member (18), and wherein the suspension structure (62) comprises a pivot structure (66) pivotally connecting the supporting member (68) to the support structure (60).
- 10 11. The hair cutting appliance as claimed in any one of the preceding claims, further characterized by at least two cutting units (17) and at least two drive spindles (24, 24a), wherein each of the at least two drive spindles (24, 24a) is arranged to be coupleable to a respective one of the at least two cutting units (17).
- 15 12. The hair cutting appliance as claimed in any one of the preceding claims, characterized in that the second coupling element (34) is releasably coupleable to the first coupling element (56).
- 20 13. A hair cutting device comprising a main housing (12) accommodating an actuator (33), and further comprising a hair cutting appliance (20) as claimed in any one of the preceding claims, wherein the support structure (60) is releasably coupled to the main housing (12), and wherein the actuator (33) is arranged to drive the drive system (64) during operation of the hair cutting device (10) when the hair cutting appliance (20) is coupled to the main housing (12).