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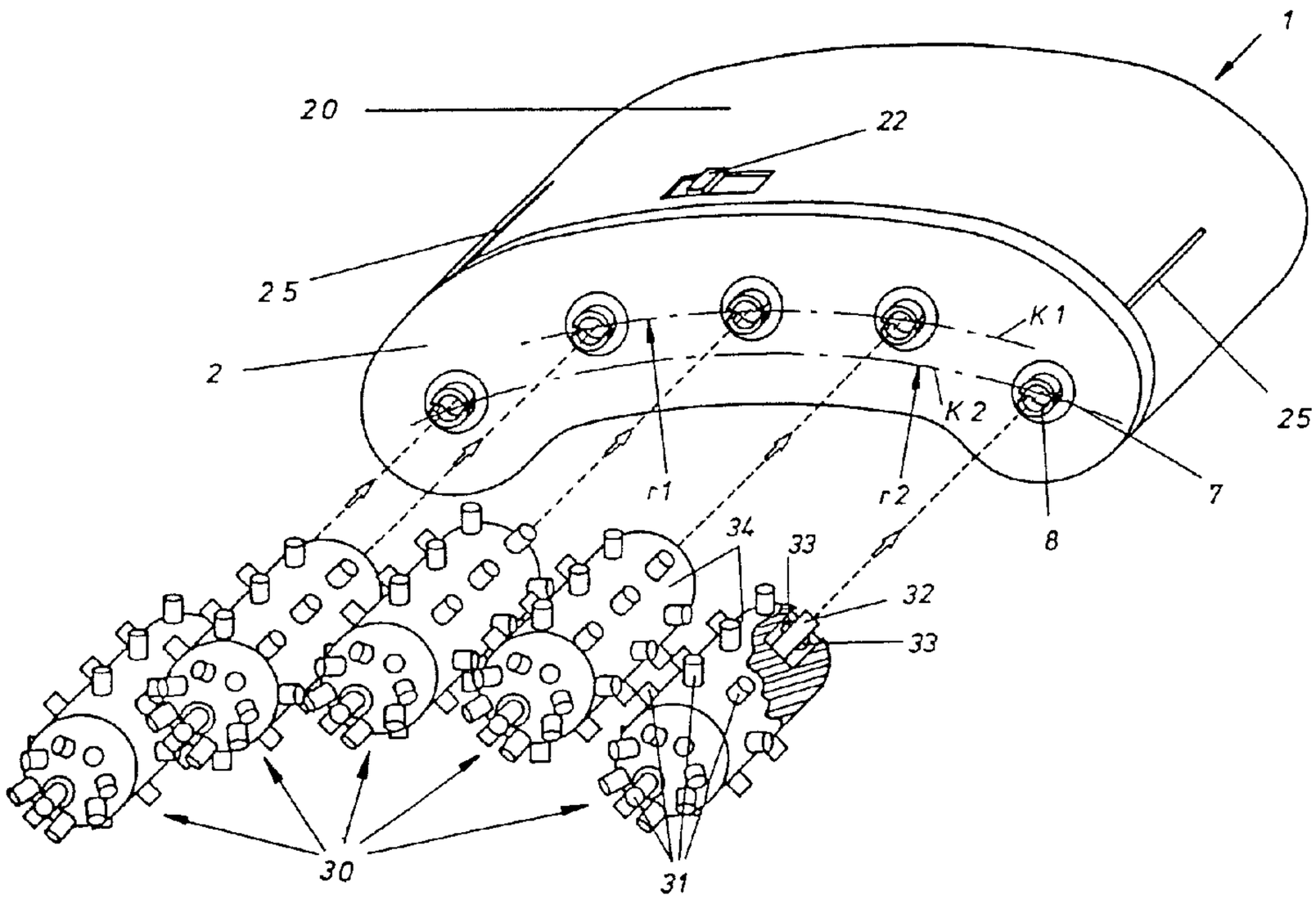

(57) Abrégé/Abstract:
The housing (1) of a hand-washing brush has a kidney-shaped profile. One narrow side of the housing (1) is designed as a bearing plate (2) for shafts (8). The shafts (8) are driven by a direct-current motor by means of a belt drive. These parts of the hand-washing brush, including a battery-assisted current supply, are protected by a handle shell (20) that also has a kidney-shaped profile and is part of the housing (1). The shafts (8) are designed so that brush cylinders (30) can be fixed thereon. The shafts (8) are arranged in arcs of circle (K1, K2) adapted to the kidney shape of the housing. The design of the housing (1) is adapted to the natural curvature of the hand surface.

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ABSTRACT

The housing (1) of a hand-washing brush has a kidney-shaped profile. One narrow side of the housing (1) is designed as a bearing plate (2) for shafts (8). The shafts (8) are driven by a direct-current motor by means of a belt drive. These parts of the hand-washing brush, including a battery-assisted current supply, are protected by a handle shell (20) that also has a kidney-shaped profile and is part of the housing (1). The shafts (8) are designed so that brush cylinders (30) can be fixed thereon. The shafts (8) are arranged in arcs of circle (K1, K2) adapted to the kidney shape of the housing. The design of the housing (1) is adapted to the natural curvature of the hand surface.

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Hand-Scrubbing Brush Comprising a Mains-Independent Motor Drive

The present invention is based on a brush suitable for the care of the human body, as set forth in the preamble of claim 1.

A brush of this type which is preferably intended for the cleansing or scrubbing of finger-nails and toe-nails within the area of the nail beds has become known from the prior published German patent specification DE 37 27 649 C1. This type of embodiment, however, is unsuitable for being utilized as a hand scrubbing brush, because there is only provided one plate-shaped brush member with the aid of which the cleansing or scrubbing of the whole hand is rather strenuous and time-consuming.

It is the object of the invention, therefore, to provide a hand scrubbing brush which has a mains-independent motor drive and permits a cleansing or scrubbing of the entire surface of the hand inclusive of the finger-nails. The brush, of course, is also suitable for the cleansing or scrubbing of dirty feet and toe-nails.

According to the invention, this object is achieved by the features as set forth in claim 1. Thus, according to a broad aspect of the invention, there is provided a hand-scrubbing brush, comprising drive means; a housing accommodating said drive means, said housing having a kidney-shaped profile with two opposite kidney-shaped sides; a plurality of rotational bodies equipped with bristles and rotatably mounted on one of said kidney-shaped sides of said housing along a line adapted to a kidney shape of said profile; and means for transmitting movement of said drive means to said rotational bodies so as to drive said

rotational bodies in form-locking and force-locking manner. Advantageous further embodiments of the subject matter of the invention are set forth in the sub-claims.

The advantages which can be achieved when employing the invention are to

be seen above all in the fact that there is provided a plurality of preferably cylindrical brush members disposed parallel in relation to one another both rotatably and interchangeably on a circular arc within the bearing plate of a kidney-shaped housing. The shape of the housing is adapted to the natural arching of the palm of the human hand. A gear mechanism is disposed between the driving motor and the brush members, and so designed that all brush members will rotate in the same direction. The brush rollers may be replaced by toothed or sprocket rollers via which an endless gear belt which, on its outside, is provided with bristles, is put into circulation.

In the following the invention will now be described in greater detail with reference being had to the accompanying drawings, in which:

Fig.1 shows a hand-scrubbing brush according to the invention in a perspective representation, with the brush rollers not in position, and

Fig.2 shows the hand-scrubbing brush of Fig.1 in a different perspective representation, with the grip sleeve removed, and with the splash-proof enclosure in position.

Fig.1, in a perspective representation, shows a hand-scrubbing brush having a mains-independent motor drive. The appliance chiefly consists of a housing 1 which, as is still to be explained in greater detail hereinafter with reference to Fig.2, encloses a DC motor 9 with a reduction gear 10, a gear belt drive 4 as well as a set of rechargeable batteries 11. The housing 1 has a kidney-shaped profile. One of its narrow sides is embodied to form a bearing plate 2 in which several shafts 8 are rotatably supported in bushes provided with shaft packings. In adaptation to the respective chosen profile of the housing 1, the bearings 7 are disposed along one of two circular arcs K1 or K2 respectively. While the three middle ones of the bearings 7 are disposed on the circular arc K1 having a radius r1, the two outer ones of the bearings 7 are disposed on the circular arc K2 having a somewhat shorter radius r2. This arrangement,

cont'd.

when maintaining an unchanged distance between bearings, permits to design a compact appliance with the housing thereof having a kidney-shaped profile. To the shape of the plate 2 there is adapted the profile of the rearward handling grip sleeve 20 together with which it forms the housing 1. On the whole, therefore, the shape of the housing 1 is clearly adapted to the natural arching of the palm of the human hand. Into the handling grip sleeve 20 a sliding contact 22 is integrated in a watertight manner. On the bottom side of the assembly there is mounted a switching magnet which forms part of a solenoid-operated switch. On both the right- and the left-hand sides the grip sleeve 20 is provided with each time two guide grooves 25 (of which each time only one can be recognized from the drawings). These guide grooves 25 serve to take up a splash-proof enclosure 40 (Fig.2) in the proper position.

In order to enable the detachable reception of brush rollers 30, each of the shafts 8 has an axial blind-end bore. The shaft ends as projecting from the plate 2 are cross-slotted. The brush rollers 30 each have a pivot or journal 32 which is let into the shaft body thereof, with these pivots or journals 32 each being provided with diametrically arranged detent latches 33. In the plugged-in state the brush rollers 30, via their pivots or journals 32, are each axially guided in the blind-end bores of the respective shafts 8, with the lateral nose members 33 lockingly engaging the cross-slots of the shafts 8, thus effecting a form-fitting interlock connection.

As is easily recognizable from Fig.1 of the drawings, the brush rollers 30 are provided with a plurality of bristle clusters 31 disposed along the circumference as well as on the end faces thereof. The divisional spacing between the shafts 8 is only somewhat larger than the diameter of the individual brush-roller body 34. The clusters or bunches of bristles 31 of neighbouring brush rollers 30 , therefore, are staggered and positioned so as to fill gaps.

Fig.2 shows the hand-scrubbing brush of Fig.1 in a different perspective representation with the grip sleeve 20 removed, thus permitting that part of the appliance to become visible which is normally hidden behind the protective

cont'd.

grip sleeve 20. On the inside and parallel in relation to the bearing plate 2 there is disposed a gear plate 3. In this gear plate 3 the shafts 8 are rotatably supported with their rearward ends. On each of the shafts 8 a gear-belt pulley 5 is firmly arranged. The DC motor 9 which is designed to form one unit together with a reduction gear 10, is flanged to the aforementioned gear plate 3. The driving shaft (which is not visible from the drawing) projects into the space between the two plates 2 and 3 and carries on its end the gear-belt pulley 5. Via a gear belt 6 which is in a form-locking connection and in engagement with all of said gear-belt pulleys 5, the shafts 8 and, consequently, the brush rollers 30 thereon, are driven by the motor 9 in the same direction of rotation.

The current for the motor 9 is supplied by a set of rechargeable batteries 11 which, for providing the necessary voltage, are series-connected in a not particularly shown manner. Included in the circuit is a magnetic contact 13 which, when the grip sleeve 20 is in position, is capable of being operated non-contactingly via the switching magnet as mounted to the slider 22. The grip sleeve 20 also includes a charging socket 23 which, via electrical lines 12, is in connection with the batteries 11 and is thus capable of being connected to an external battery charger. This charging socket 23 can be protected against splashwater by providing a protective cover or cap 24. The slipped-on grip sleeve 20 is retained in position with the aid of the screws 21. A packing ring 14 let into the circumferential groove of the bearing plate 2 takes care of sealing the grip sleeve 20 with respect to the plate 2.

In order to protect the user from the splashwater of the rotating brush rollers 30 there is provided a splash-proof enclosure 40 which is intended to cover up that particular side of the hand scrubbing brush which is just not in use. For this particular purpose the splash-proof enclosure 40 can be re-positioned as required. Corresponding to the guide grooves 25 of the grip sleeve 20, also the splash-proof enclosure 40 has two guide members 41 which are disposed at a distance corresponding to the clear width of the grip sleeve 20 and are

formed in accordance with the outer contours of the grip sleeve 20 within the area of the guide grooves 25 as pairwisely provided for therebetween. The longitudinal edges of the guide members 41 are designed as strip-shaped engaging elements 42. In the plugged-in condition the engaging elements 42 formlockingly engage into the guide grooves 25 as provided for in the grip sleeve 20 thus ensuring the splash-proof enclosure 40 to be firmly retained in position.

According to a modified embodiment, the brush rollers 30 may also be replaced by toothed or sprocket rollers which are put into circulation by an endless gear belt which is provided with bristles on its outer side. Within the area of the concave arching the gear belt is freely tensioned. In this way it can adapt itself to the unevennesses of the human hand to be scrubbed or cleansed.

In order to achieve a scrubbing or cleansing effect to be improved in the individual case it might be desirable to change the direction of rotation of either the brush rollers 30 or the gear belt provided with bristles. This may be accomplished in a simple way by effecting a polarity reversal of the DC motor 9, e.g. via a second solenoid-operated switch designed to operate as a changeover switch.

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CLAIMS:

1. A hand-scrubbing brush, comprising drive means; a housing accommodating said drive means, said housing having a kidney-shaped profile with two opposite kidney-shaped sides; a plurality of rotational bodies equipped with bristles and rotatably mounted on one of said kidney-shaped sides of said housing along a line adapted to a kidney shape of said profile; and means for transmitting movement of said drive means to said rotational bodies so as to drive said rotational bodies in form-locking and force-locking manner.

2. A hand-scrubbing brush as defined in claim 1, wherein said drive means is a motor drive.

3. A hand-scrubbing brush as defined in claim 1, wherein said housing is a water-tight housing.

4. A hand-scrubbing brush as defined in claim 1; and further comprising an operating switch integrated in said housing.

5. A hand-scrubbing brush as defined in claim 1, wherein said rotational body is arranged on said line formed as an arcuate line.

6. A hand-scrubbing brush as defined in claim 1, wherein said rotational body is arranged on said line formed as a curved line.

7. A hand-scrubbing brush as defined in claim 1, wherein said transmitting means is formed as a gear, mechanism.

8. A hand-scrubbing brush as defined in claim 7, wherein said gear mechanism is formed so that said rotational bodies rotate in a same direction of rotation,

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said drive means including a motor which is connected with said gear mechanism and has a reversible direction of rotation.

9. A hand-scrubbing brush as defined in claim 1, wherein said one narrow side of said housing is formed as a bearing plate, said drive means including a motor drive and said transmitting means including a gear mechanism which are mounted on said bearing plate; and further comprising a removal, water-tightly sealed grip sleeve which together with said bearing plate forms said housing.

10. A hand-scrubbing brush as defined in claim 9, wherein said grip sleeve and said bearing plate are shaped so as to adapt to a natural arching of a palm of a human hand.

11. A hand-scrubbing brush as defined in claim 9; and further comprising an operating switch integrated in said housing and formed as a solenoid-operated switch, said solenoid-operated switch having a switching magnet formed as a sliding contact disposed within said grip sleeve in a water-tight manner.

12. A hand-scrubbing brush as defined in claim 9; and further comprising a splash-proof enclose which is slippable onto said grip sleeve.

13. A hand-scrubbing brush as defined in claim 1, wherein said rotational bodies are arranged removably in said housing.

14. A hand-scrubbing brush as defined in claim 1, wherein said one narrow side of said housing is formed as a bearing plate, said rotational bodies being provided with bearing bushings distributed in said bearing plate along two

circular arc lines, with a radius of a circular arc serving outer ones of said bearing bushings being smaller than a radius of a circular arc serving inner ones of said bearing bushings.

15. A hand-scrubbing brush as defined in claim 1, wherein bristles of said rotational bodies are arranged in clusters; and further comprising a plurality of brush rollers, said clusters of bristles associated with neighboring ones of said brush rollers being staggered and positioned so as to fill gaps between said brush rollers.

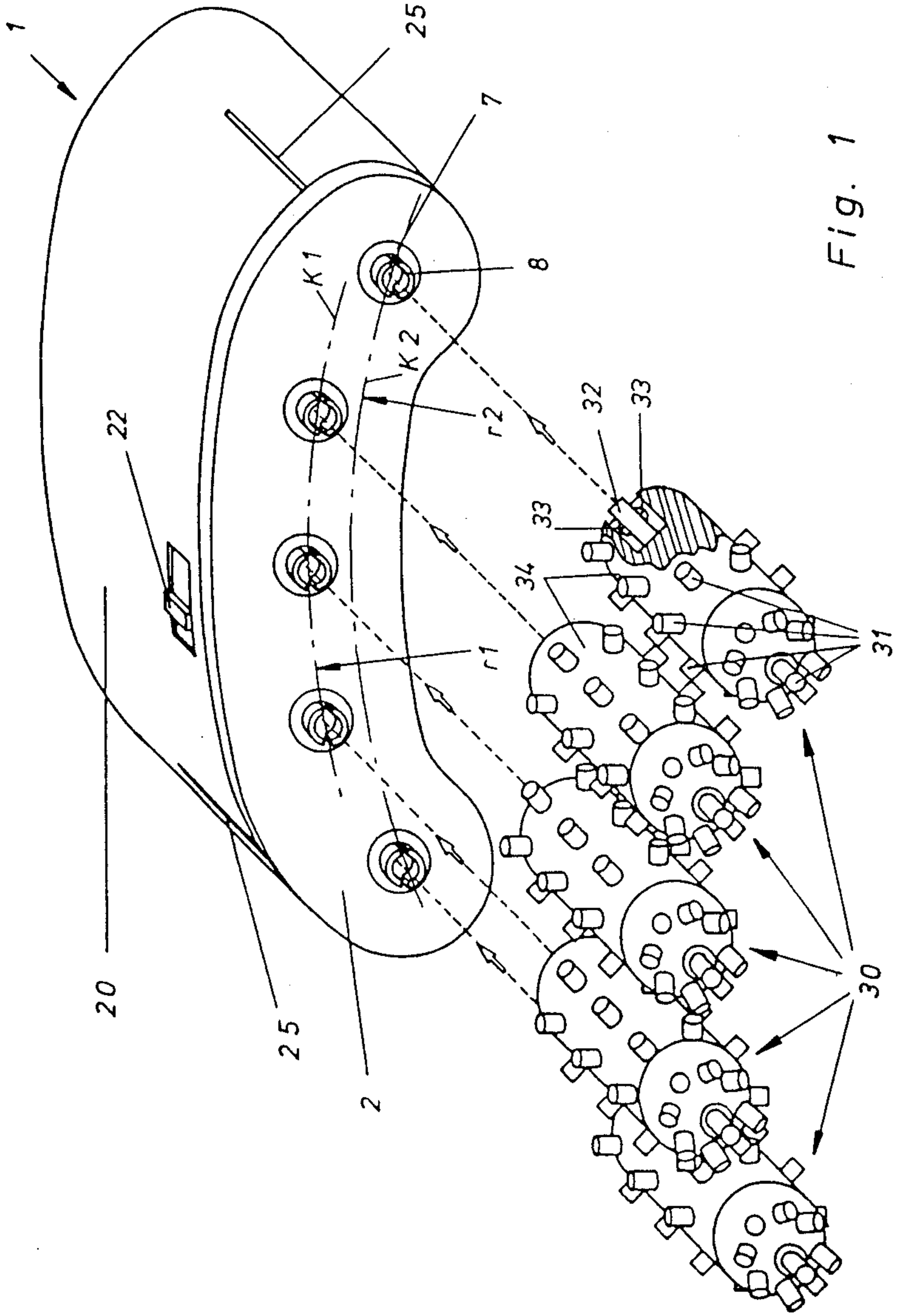


Fig. 1

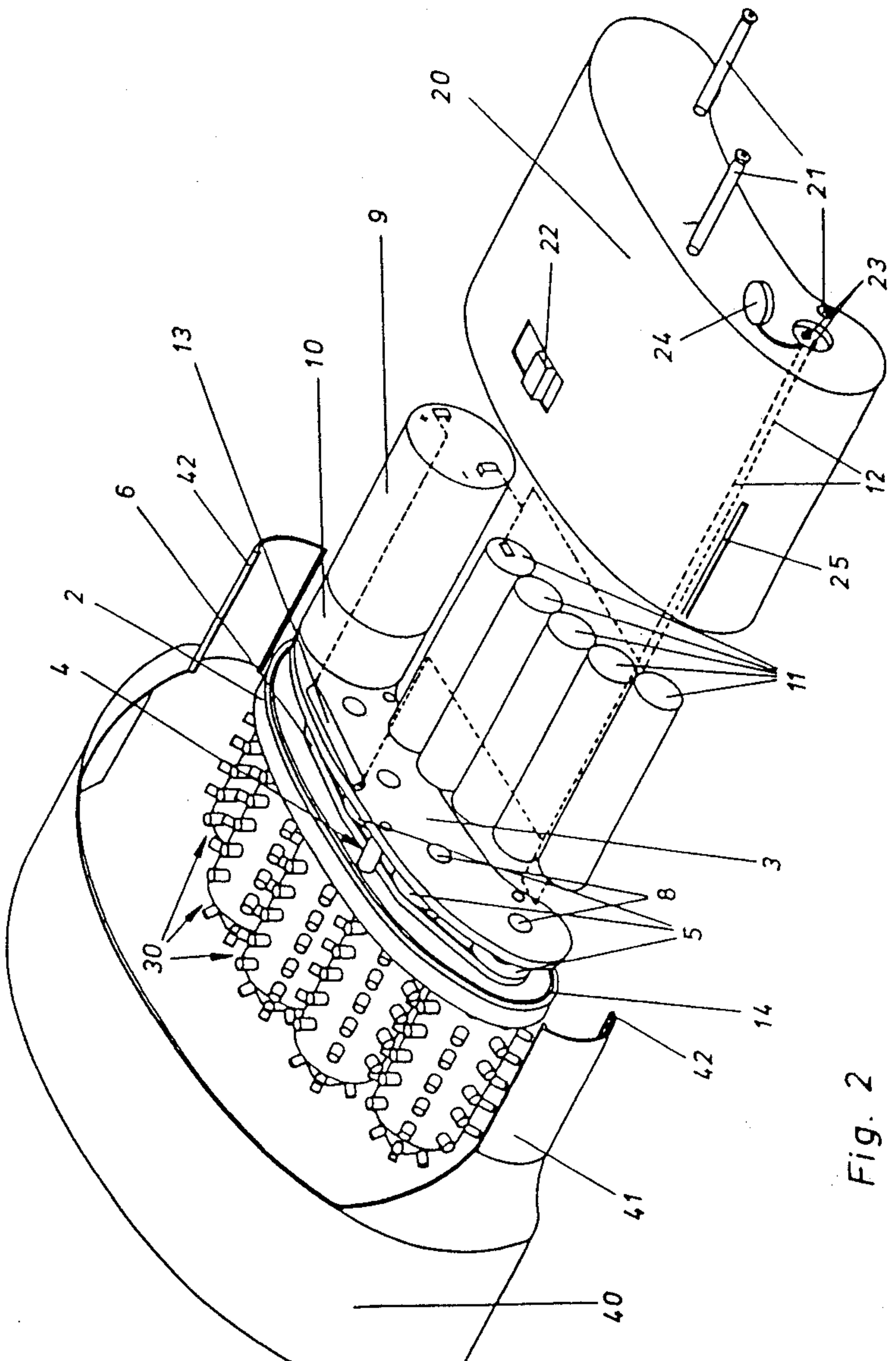
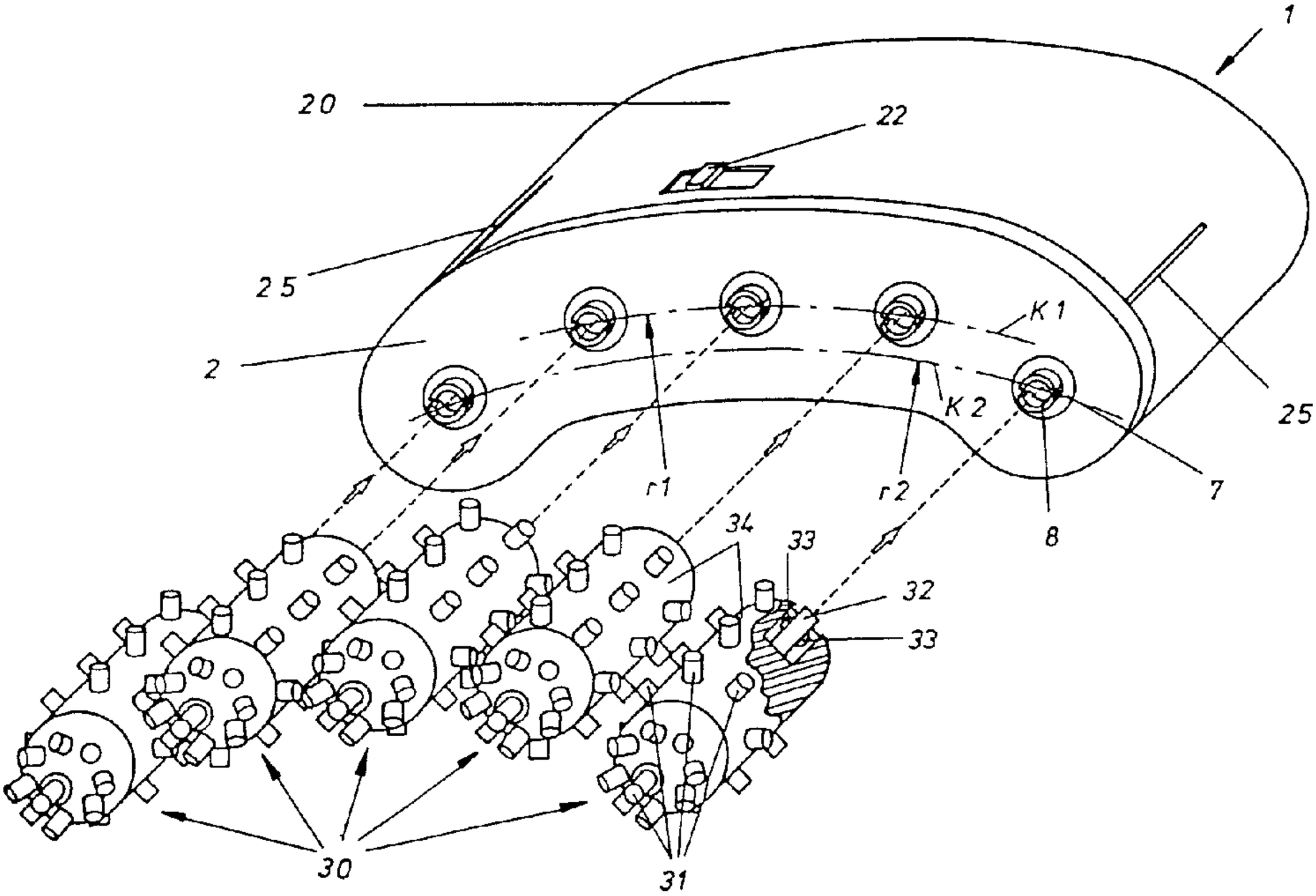


Fig. 2


1
20
22
25
2
K1
K2
25
r1
r2
7
8
34
33
32
33
30
31