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(72) Inventor: **Bonomelli, Federico**
22042 Dolzago (LC) (IT)

(74) Representative: **Savi, Alberto**
c/o CON LOR SPA,
Via Renato Fucini, 5
20133 Milano (IT)

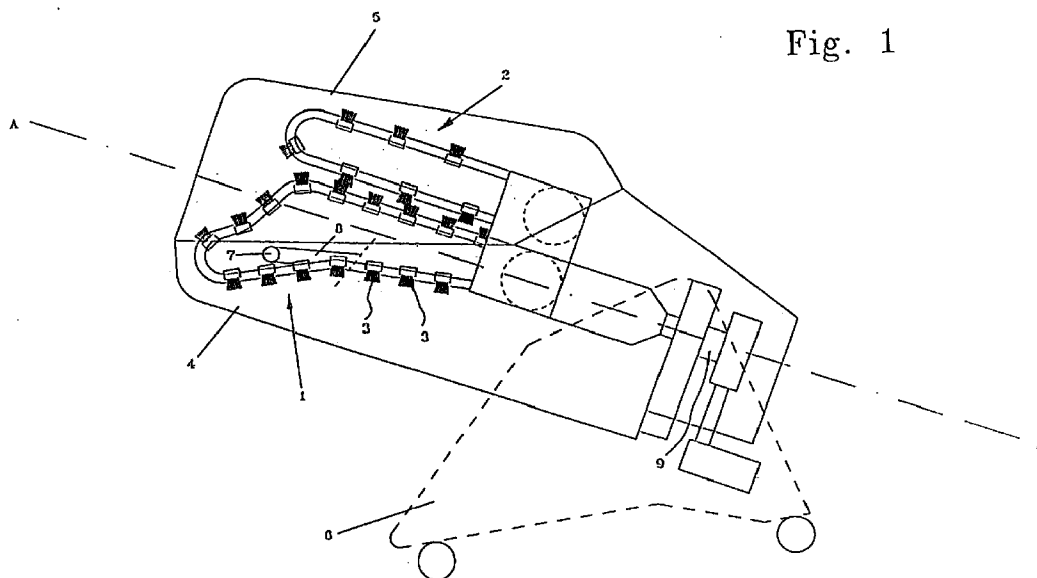
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(71) Applicant: **MAKO SHARK S.r.l.**
I-22042 Dolzago (CO) (IT)

(54) Hair-washing machine

(57) Hair-washing machine comprising at least one set of brushes (3) which move along a support (1) on which the user's head rests, the said brushes (3) being associated with systems (7,8) designed to direct water and/or water and a cleansing product onto the area to be treated, wherein said brushes (3) are driven along a support (1) which presents at least one section shaped

to allow the user's head to rest on it, and wherein that systems are provided, designed to control the rotation of the said supports with the said brushes (3) around the user's head, so that the said massage action is exerted on the whole surface of the scalp.



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Description

This invention relates to a hair-washing machine comprising equipment, specifically a set of brushes, designed to exert a mechanical action which massages the scalp, in association with equipment designed to spray water or water and shampoo onto the head.

In particular, in accordance with a preferred aspect of the invention, the said brushes associated with the said spraying equipment are made to rotate through 360° during the operation in order to massage the scalp on all sides.

The assembly constituted by the brushes and associated drive mechanism is situated inside an opening shell which acts as a casing for the equipment and also as a recovery tank for the water used.

The machine, specially designed for use in hair salons, is intended to meet the need, increasingly felt in the trade, to improve the quality of one of the most frequently performed operations, namely hair washing or shampooing.

In the long run this operation becomes monotonous and repetitive for the operator, and is also unhealthy because the hands continually come into contact with the cleansing products and other products used.

Gloves are rarely used to protect the hands because of the discomfort caused to the customer and loss of the tactile sensitivity which is required in this kind of operation, particularly if it is borne in mind that a shampoo should relax the customer by massaging the skin, thoroughly cleanse the scalp and hair, treat the hair gently to prevent damage to it and prevent the formation of knots and tangles in the hair.

In the past, attempts have been made to design equipment which performs this operation automatically, but the results have always been unsatisfactory.

The various types of machine currently known all involve the use of jets of pressurised water as cleaning elements, and therefore exploit a principle (similar to the one used in dishwashers) which presents two drawbacks.

Firstly, a satisfactory cleansing effect cannot be obtained with pressurised water jets alone because, as the hair is highly porous and impregnated with the sebum released by the skin, the water would have to be at an excessive pressure and temperature to achieve thorough cleanliness.

Secondly, it has proved impossible to design a customisable, effective seal between the nape of the neck and the casing containing the nozzles, with the result that a certain amount of water leaks out and trickles down the user's face and neck.

These drawbacks are eliminated by the hair-washing machine in accordance with the invention, which includes equipment designed to exert a mechanical action on the scalp, rubbing the hair and accompanying this mechanical action with jets of water and/or water and a cleansing product.

In particular, the machine in accordance with the invention includes a shaped plate on which the head is rested; a brush which massages and rubs the skin and hair runs along this plate, accompanied by a flow of water and/or water and a cleansing product.

The said plate revolves around an axis parallel to the direction of movement of the brush so that it rotates through 360° and exerts this action on the whole of the user's head.

These and other characteristics will appear more clearly from the following detailed description, supplied by way of example and not of limitation by reference to the annexed figures, in which:

- figure 1 schematically illustrates a side view of the whole of a machine in accordance with the invention
- figure 2 is a schematic view similar to that shown in figure 1, in which some of the mechanisms that operate the brush movement are shown in greater detail
- figure 3 illustrates a detail of the machine in accordance with the invention in cross-section, showing a plane passing through the axis of rotation of the plates.

With reference to figure 2, the machine in accordance with the invention comprises a pair of plates, indicated as a whole by numbers 1 and 2, on each of which a set of brushes 3 (illustrated in figure 1) runs; these brushes are driven by motor systems which will be described below.

The front end of plate 1 is shaped to allow the user's head to rest on it, and the corresponding set of brushes is designed to massage the skin and the scalp.

Plate 2, which is shorter than plate 1, supports a set of brushes whose sole function is to counteract and cooperate with the brush attached to plate 1 to keep long hair taut and brush it during washing.

Plates 1 and 2, with the corresponding mechanisms, are contained in a casing consisting of a pair of shells 4 and 5, the first of which acts as a container for the equipment and as a tank for the collection of the water used, while the second constitutes the lid of the machine.

The whole unit is mounted on support frame 6. A pipe 7 with a number of nozzles which dispense washing water, mixed with shampoo if required, is fitted to the shaped front part of plate 1.

This water is supplied through a pipe 8.

In accordance with the invention, the assembly constituted by plates 1 and 2 is rotated around an axis A-A so that it performs a complete revolution and causes the brush of plate 1 to exert its action on the whole of the user's head.

For this purpose the plate support frame is fitted to a shaft 9 with a built-in cogwheel 10 or the like, which is engaged by a reduction gear unit 11 connected to a

motor 12.

When motor 12 is operated it drives shaft 9, causing it to revolve around its own axis and thus making the assembly constituted by plates 1 and 2 rotate inside the casing formed by shells 4 and 5.

Plates 1 and 2 with the corresponding brushes are fitted to frames, schematically illustrated and indicated by numbers 13 and 14 in figure 1; frame 14 is hinged laterally to frame 13 so that it can open and revolve around an axis parallel to axis A-A.

The supports of brushes 3 are fixed to a pair of chains, belts or the like which are made to move along plates 1 and 2 in the direction of arrows F.

A motor, indicated as no. 15 in figure 2, is fitted for this purpose; via a suitable reducer the said motor activates a cogwheel 16, connected to one of the rollers to which the drive chains of the bottom brush are fitted.

The brush of top plate 2 is fitted to idle rollers, one of which is connected to a cogwheel 17 which engages with cogwheel 16 when the plates close above one another.

With reference to figure 3, no. 27 indicates a support sleeve integral with the frame of the machine, which contains the parts that transmit motion to the brushes and plates.

In particular, a hollow shaft 18 is fitted in sleeve 27 via bearings coupled to seals; this shaft is connected externally to a connector 19 to supply water, which flows through openings 20 into the tank.

Shaft 18 is integral with the plate support frame, and cogwheel 10, driven by motor 12, is force-fitted to it. Shaft 18 therefore revolves around axis A-A, causing plates 1 and 2 to rotate with it.

A second shaft 21, which causes shaft 23 to rotate with the brush drive roller fitted on plate 1 via a bevel gear pair 22, is fitted inside shaft 18.

The machine operates as follows:

When the casing has been opened by raising shell 5, the plates also open and the user rests the back of her neck on the front part of plate 1.

If the user has long hair it is spread out behind her on plate 1. The top plate is closed and takes up the position shown in the figures, in which wheels 16 and 17 engage with one another.

Shell 5 is then closed, and the machine can be switched on.

Preheated water, which can be mixed with a cleansing product such as shampoo or the like if required, is conveyed into the tank formed by bottom shell 4 through hollow shaft 18 and openings 20.

A pump of known type, not illustrated in the figures, conveys water through pipe 8 to nozzles 7, which spuser rests the back of her head onto the brushes of plate 1 and onto the user's head.

Motor 15 starts up at the same time, and moves the brushes fitted on plates 1 and 2 via wheels 16 and 17.

The bottom brush massages the scalp and rubs the hair, with the top brush acting as its counterpart.

Motor 12 also starts up, and causes shaft 18 and the pair of plates 1 and 2 to revolve around axis A-A via reduction gear 11.

The area of contact between the brush of plate 1 and the user's head changes with a circular movement, with the result that the brush massages the whole of the scalp.

When one or more revolutions have been completed the water with the cleansing product is drained off, and a similar operation is performed with clean rinsing water.

The machine in accordance with the invention therefore produces an efficient hair washing action together with a skin massage, without the drawbacks of known machines.

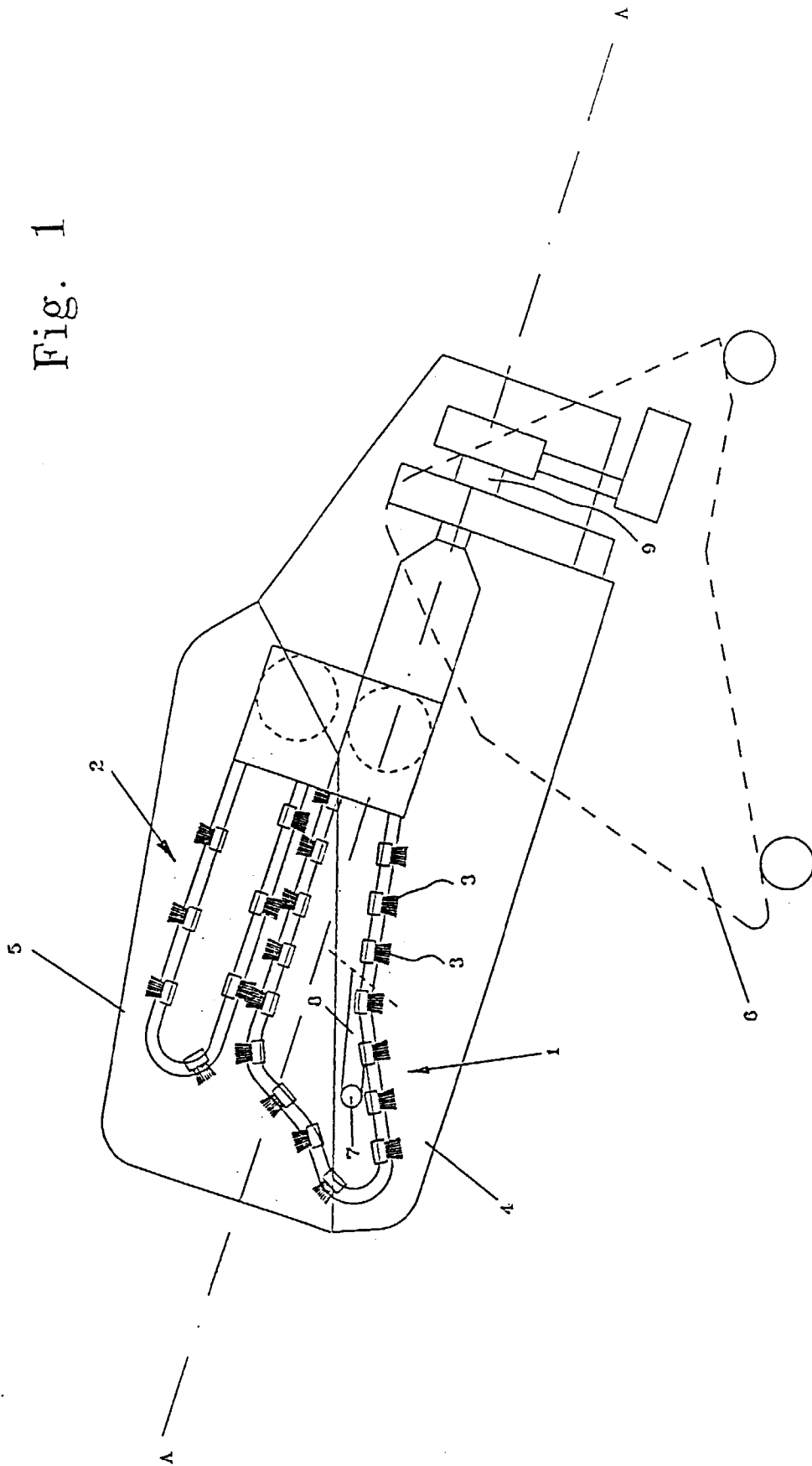
An expert in the field could devise numerous modifications and variations, all of which should be deemed to fall within the scope of this invention.

Claims

1. Hair-washing machine characterised by the fact that it comprises a combination of systems designed to perform a massaging action on the scalp, and systems designed to direct a jet of water onto the area massaged.
2. Hair-washing machine in accordance with claim 1, characterised by the fact that it contains at least one set of brushes which move along a support on which the user's head rests, the said brushes being associated with systems designed to direct water and/or water and a cleansing product onto the area to be treated.
3. Hair-washing machine in accordance with claim 2, characterised by the fact that the said brushes are driven along a support which presents at least one section shaped to allow the user's head to rest on it, and that systems designed to control the rotation of the said supports with the said brushes around the user's head are fitted so that the said massage action is exerted on the whole surface of the scalp.
4. Hair-washing machine in accordance with claim 3, in which the said supports revolve around an axis which is parallel to the direction of movement of the said brushes and passes through the user's head.
5. Hair-washing machine in accordance with the preceding claims, characterised by the fact that it contains two sets of brushes driven along a pair of opening supports, and that cogwheels which drive the said brushes mutually engage when the said supports are closed so that the said brushes are positioned opposite one another.

6. Hair-washing machine in accordance with the preceding claims, characterised by the fact that the said brushes are mounted on frames contained in a casing constituted by a pair of shells which close around the user's head, one of which shells acts as a tank for the washing water. 5
7. Hair-washing machine in accordance with the preceding claims, characterised by the fact that the said brushes are mounted on a frame fixed to the end of a hollow shaft which is fitted to a sleeve integral with the machine casing, and that the said shaft presents a connection for the supply of a fluid on one side and openings designed to direct the said fluid to the interior of the said casing on the other side. 10 15
8. Hair-washing machine in accordance with claim 7, characterised by the fact that inside the said hollow shaft there is a second shaft coaxial with the first, connected to a motor unit on one side and fitted on the opposite side with a pinion which engages with a corresponding crown gear integral with the drive wheel of one of the said brushes. 20 25
9. Hair-washing machine comprising:
- a support to which a swivelling casing, constituted by a pair of shells that close around the user's head, is fitted 30
 - a frame to which systems designed to drive a number of brushes are fitted, which frame has one end shaped so that the user's head can rest on it
 - equipment designed to move the said brushes along the said frame and equipment designed to rotate the said frame around the user's head 35
 - equipment designed to direct a jet of water onto the user's head. 40
10. Hair-washing machine as described and illustrated. 45 50 55

Fig. 1



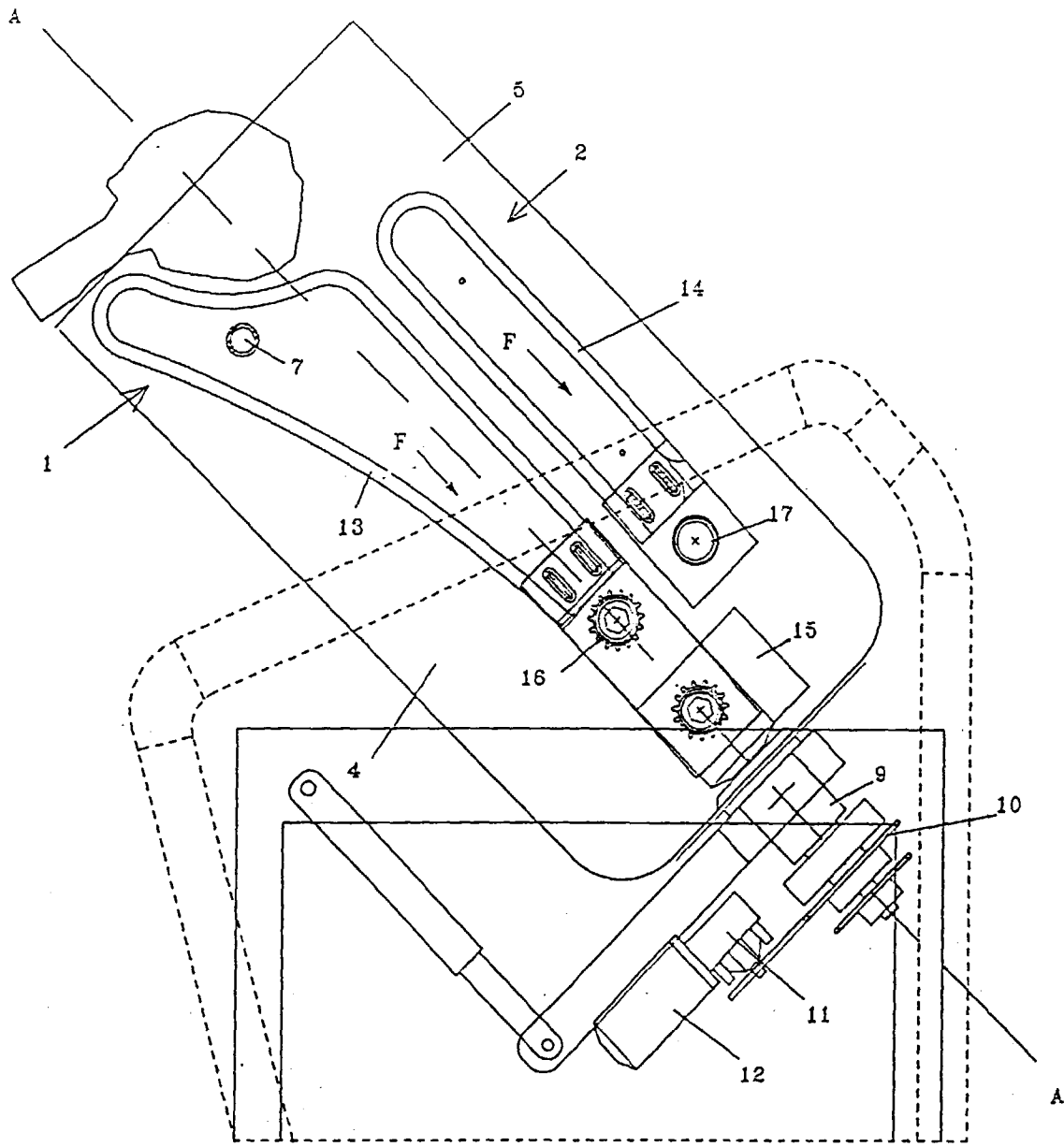


Fig. 2

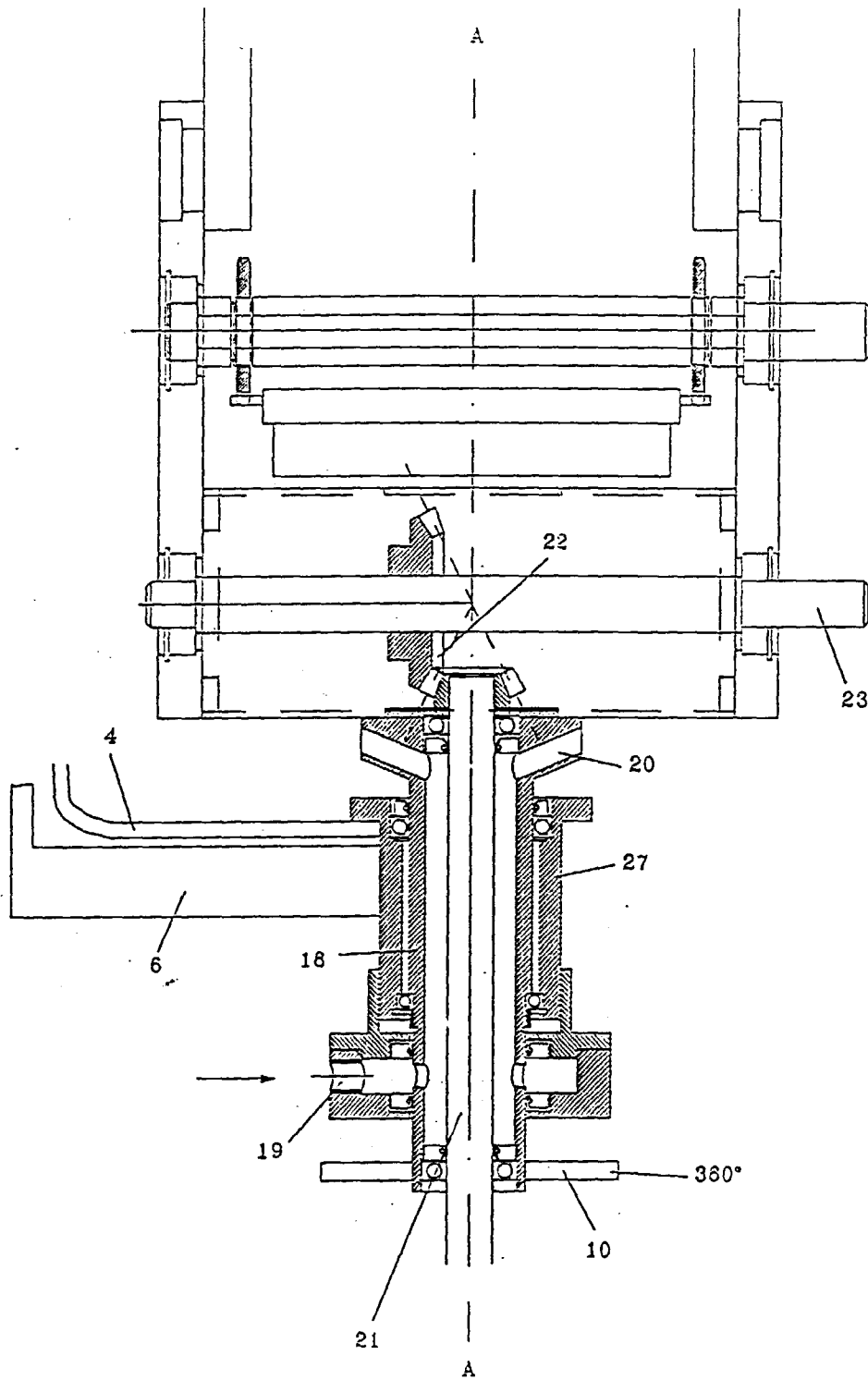


Fig. 3



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EUROPEAN SEARCH REPORT

Application Number
EP 97 11 3636

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	GB 1 272 394 A (GORDON PARKER) * page 1, line 9 - page 1, line 14 * * page 1, line 64 - page 1, line 72 * * page 1, line 88 * * page 2, line 20 - page 2, line 25 * * page 2, line 40 - page 2, line 45 * * page 2, line 57 - page 2, line 63; figures 1-3 *	1,2	A45D19/14
A	---	3-10	
X	US 3 575 181 A (RUDD RICHARD E) * column 1, line 6 - column 1, line 9 * * column 2, line 10 - column 2, line 20 * * column 2, line 34 - column 2, line 67 * * column 3, line 12 - column 3, line 16; figures 2-9 *	1	
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The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 5 March 1998	Examiner Lang, D
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P04C01)



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EUROPEAN SEARCH REPORT

Application Number
EP 97 11 3636

DOCUMENTS CONSIDERED TO BE RELEVANT			
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
Place of search MUNICH		Date of completion of the search 5 March 1998	Examiner Lang, D
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document			

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