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(54) **Bristle-dividing element for an apparatus for making brushes or brooms**

(57) A bristle-dividing element (1) associable with a punch (P) of an apparatus for producing brushes or

brooms, comprises a supporting arm (2) to which a pivot element (5) is fixed on which at least one revolving element (6; 6') is mounted so as to be free to rotate.

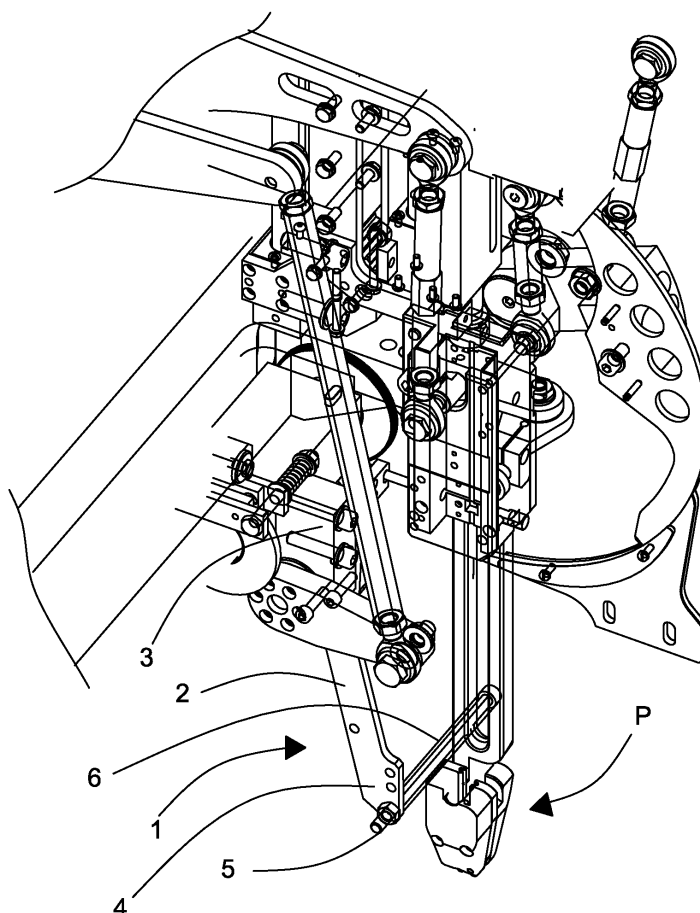


Fig. 1

Description

[0001] The present invention relates to a so-called bristle-dividing element for an apparatus for producing brushes or brooms.

[0002] In apparatuses for producing brushes or brooms, groups of bristles are inserted into a bristle-holding body by means of punches that insert the groups of bristles into holes made in the bristle-holding body.

[0003] As the holes in the bristle-holding body are in general very near one another, during the insertion operation it is necessary that the groups of bristles already inserted into the bristle-holding body do not hinder the insertion of the groups of bristles that are still to be inserted.

[0004] For this purpose associating a so-called bristle-dividing element with each punch is known, such bristle-dividing element, by moving in synchrony with the punch, flexes groups of bristles that have already been inserted into the bristle-holding body to make the hole accessible to the punch, into which hole a subsequent group of bristles has to be inserted.

[0005] The bristle-dividing element, at the end of the insertion operation of a group of bristles into the bristle-holding support, also facilitates extracting of the group of bristles from the punch.

[0006] The bristle-dividing elements that are known from the state of the art consist of a bar fixed stiffly to an oscillating arm associated with the punch, which moves synchronously with the punch.

[0007] When the bristle-dividing element interacts with the groups of bristles, the latter slide on said bar, causing a progressive damage thereto. This damage is particularly rapid when groups of bristles are used that are coated with abrasive material, for example for making abrasive brushes.

[0008] This gives the bristle-dividing element a very short life, the bristle-dividing element having to be replaced frequently, which causes the apparatus to shut down for the time that is necessary for replacing the damaged bristle-dividing element, with a consequent loss of productivity and high operating costs.

[0009] The present invention aims to provide a bristle-dividing element that is associable with a punch of an apparatus for making brushes or brooms that has a working life that is noticeably greater than that of known prior-art bristle-dividing elements.

[0010] According to the present invention a bristle-dividing element is provided that is associable with a punch of an apparatus for producing brushes or brooms, comprising a supporting arm to an end of which a pivot element is fixed, to which at least one revolving element is mounted so as to be free to rotate.

[0011] When the bristle-dividing element according to the invention interacts with the groups of bristles, the latter slide on at least one revolving element, causing the latter to rotate around the pivot element, thus minimising the friction between the group of bristles and the bristle-

dividing element. This makes sure that the wear of the at least one revolving element due to contact thereof with the groups of bristles is also minimised with a consequent sensible increase in the working life of the bristle-dividing element.

[0012] Further, when the at least one revolving element is worn, replacing thereof is simple and inexpensive.

[0013] In a preferred embodiment of the invention, the at least one revolving element comprises a plurality of revolving elements mounted so as to be free to rotate on the pivot element.

[0014] This solution has the advantage that it is not necessary, due to wear, replacing the entire set of revolving elements but only those that are most worn, thus reducing replacement costs.

[0015] The invention is disclosed in greater detail below purely by way of non-limiting example, with reference to the attached drawings, in which:

Figure 1 is a perspective view of a punch of an apparatus for making brushes or brooms, associated with a bristle-dividing element;

Figure 2 is a perspective schematic view of a first embodiment of a bristle-dividing element according to the invention;

Figure 3 is a perspective schematic view of a second embodiment of a bristle-dividing element according to the invention.

[0016] In Figures 1 and 2 there is shown a first embodiment of a bristle-dividing element 1 according to the invention.

[0017] In Figure 1 there is shown a punch P of an apparatus for producing brushes or brooms, which is suitable for inserting groups of bristles into a bristle-holding body of a brush or of a broom.

[0018] With the punch P a bristle-dividing element 1 is associated comprising an arm 2 connected, for example at a first end, to a driving device 3, that is suitable for driving the arm 2, with oscillating motion. To the arm 2 a pivot 5 is fixed on which at least one revolving element 6 is mounted so as to be free to rotate, for example roller-shaped. The pivot 5 can be fixed, for example, to a second end 4 of the arm 2. The at least one revolving element 6 is made of material having great resistance to wear, for example hardened steel.

[0019] In the first embodiment of the invention, the at least one revolving element comprises a single roller-shaped revolving element 6.

[0020] When the bristle-dividing element comes into contact with a group of bristles, the latter slide on the surface of the revolving element 6 rotating the revolving element around the pivot 5. In this manner, between the group of bristles and the revolving element 6, there is only rolling friction, the value of which, as is known, is noticeably less than the value of the sliding friction, like that which is obtained in the contact between a group of

bristles and a bristle-dividing element according to the state of the art.

[0021] Consequently, the bristle-dividing element 1 according to the invention is subject to much more gradual wear than the wear of the bristle-dividing elements according to the state of the art. This noticeably increases the working life of the bristle-dividing element 1 according to the invention, in particular in the case of use in making brushes provided with bristles covered with abrasive material.

[0022] Further, when the degree of wear of the bristle-dividing element 1 according to the invention makes it necessary to replace the bristle-dividing element 1, it is not required to replace the entire bristle-dividing element, but only the revolving element 6, with significant cost and time savings. In fact, it is sufficient to dismantle the pivot element 5 from the arm 2 of the bristle-dividing element 1, to remove the worn revolving element 6 from the bristle-dividing element 1, to replace the worn revolving element 6 with a new revolving element 6 and to reassemble the pivot 5 with the new revolving element 6 on the arm 2 of the bristle-dividing element.

[0023] In Figure 3 there is illustrated a second embodiment of the invention, in which on the pivot 5 a plurality of revolving elements 6' is mounted so as to be free to rotate, each roller-shaped, each revolving element 6' thereof being made of a material having great resistance to wear, for example hardened steel.

[0024] This second embodiment of the invention has the advantage that, as the wear is not uniform on all the revolving elements 6', it is possible to maintain the bristle-dividing element 1 in efficient working condition by replacing only the revolving elements 6' the wear of which has exceeded a preset limit, thus reducing the corresponding costs.

[0025] Also in this case, the worn revolving elements 6' can be replaced rapidly by dismantling the pivot 5 from the arm 2 of the bristle-dividing element 1 and replacing the worn revolving elements 6' with new ones, and then reassembling the pivot 5, with the revolving elements 6' on the arm 2 of the bristle-dividing element 1.

[0026] In the practical embodiment, the materials, the dimensions and the constructional details may be different from those indicated but be technically equivalent thereto without thereby falling outside the scope of the present invention, as defined by the claims. For example, the pivot 5, could have an arched shape, or a polygonal shape, the revolving elements 6' being shaped and arranged so as to be free to rotate on the pivot 5.

2. Bristle-dividing element (1) according to claim 1, wherein said at least one revolving element (6; 6') comprises a single roller-shaped revolving element (6).

3. Bristle-dividing element (1) according to claim 1, or 2, wherein said single revolving element (6) is made of material having great resistance to wear.

4. Bristle-dividing element (1) according to any preceding claim, wherein said at least one revolving element (6; 6') comprises a plurality of revolving elements (6') each of which is roller-shaped.

5. Bristle-dividing element (1) according to claim 4, wherein said plurality of revolving elements (6') is made of a material that is resistant to wear.

Claims

1. Bristle-dividing element (1) associable with a punch (P) of an apparatus for producing brushes or brooms, comprising a supporting arm (2) to which is fixed a punch element (5), on which at least one revolving element (6; 6') is mounted so as to be free to rotate.

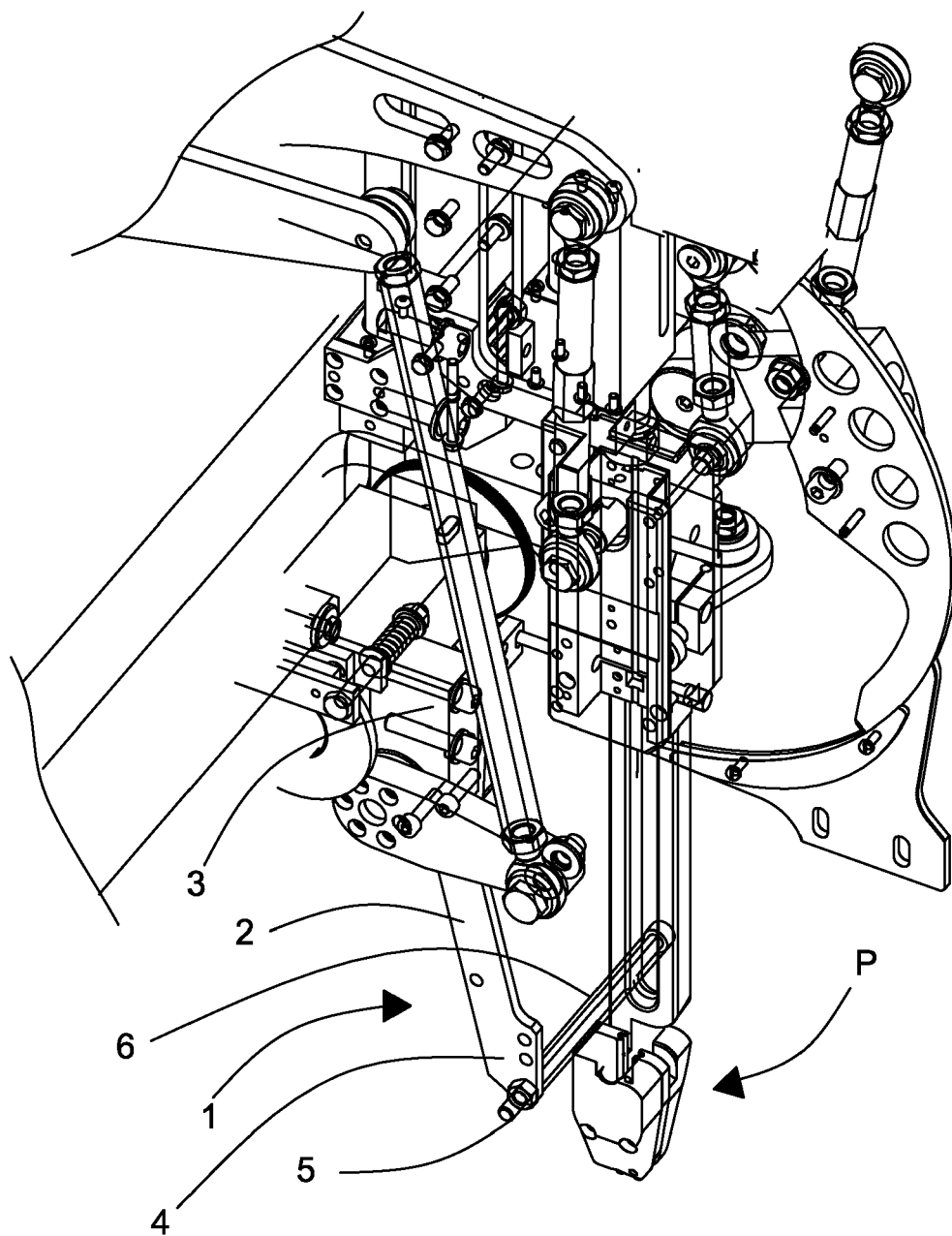
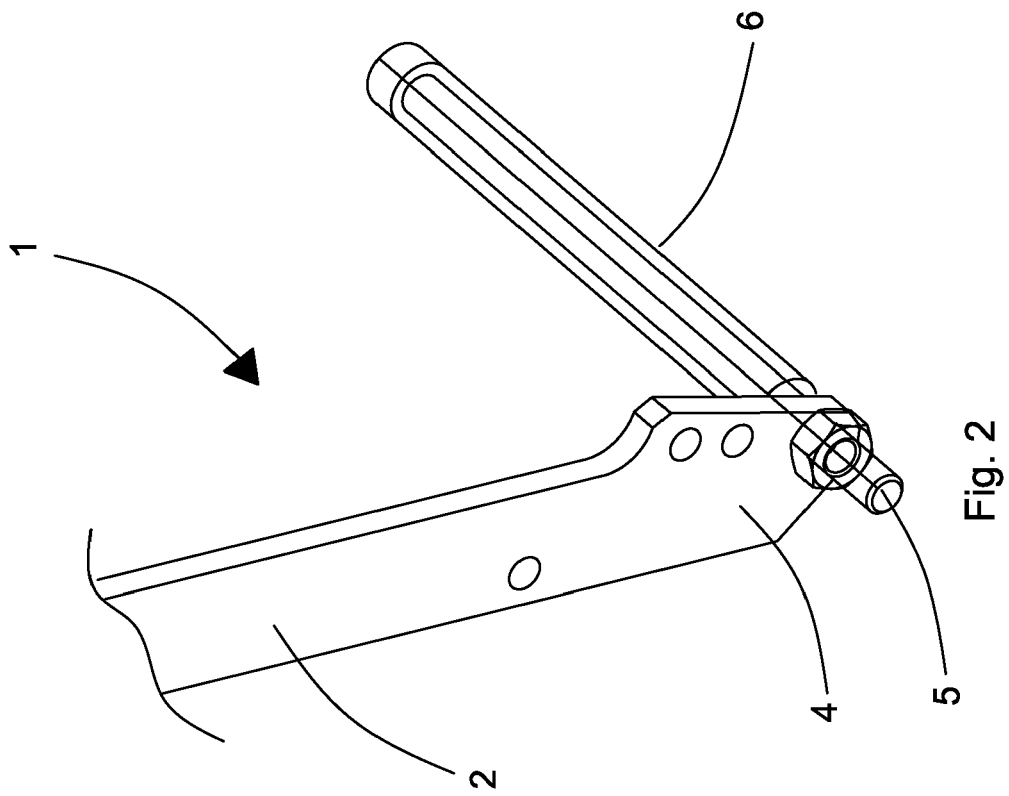
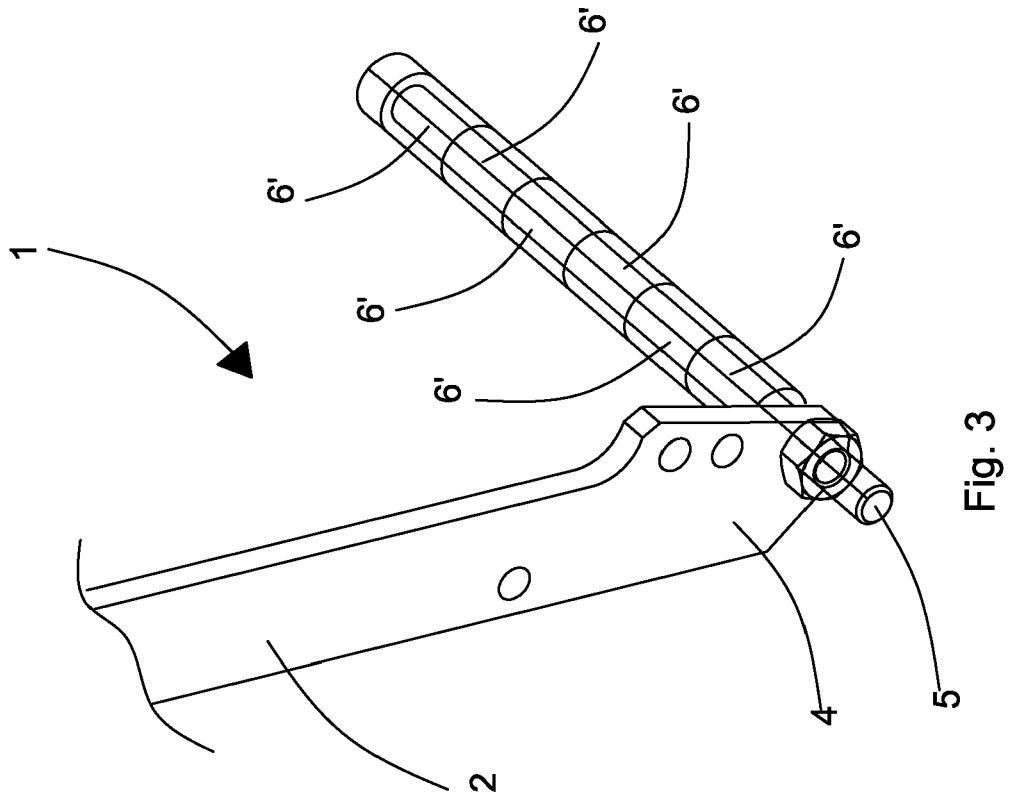


Fig. 1





EUROPEAN SEARCH REPORT

Application Number
EP 09 16 8757

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 493 355 A (BOUCHERIE NV G B [BE]) 5 January 2005 (2005-01-05) * the whole document *	1-5	INV. A46D3/04
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			TECHNICAL FIELDS SEARCHED (IPC)
			A46D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 21 January 2010	Examiner Acerbis, Giorgio
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 16 8757

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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21-01-2010

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