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⑤④ **A METHOD OF MANUFACTURING A PLASTIC-FRAMED BRUSH ELEMENT.**

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⑤⑥ References cited :
**EP-A- 0 023 844
DE-A- 1 962 926
DE-A- 2 109 972**

⑤⑥ References cited :
**FR-A- 2 414 889
US-A- 2 655 409
US-A- 2 812 214
US-A- 3 626 509
US-A- 4 092 758**

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Description

This invention concerns a method of manufacturing a plastic-framed brush element.

FR-A-2 414 889 discloses a method of manufacturing a plastic-framed brush element, in which a strip of a thermoplastic material is fixed on layers formed of brush fibres by passing a fixing tool.

Further previously known brush elements have been manufactured in such a way that the bristle fibres have been melted or glued together at one end to form in this way a 0,5-1,5 cm thick comb-like ribbon. There are in existence various different recognized manufacturing methods for joining the fibres together. The fibre ribbon that is manufactured by joining together is then pressed into a metal backing part, when a finished product is formed in which the points of the fibres point straight outwards from the metal backing strip. Brushes are usually straight strips or have round cylinder-like brush disk form. This present method, however, includes very many work stages in the manufacture of the metal backing strip, so that the manufacturing time of the product has become unnecessarily great. Also when the brushes are in use the metal backing strips sometimes open and the fibres become detached from it. In cylinder-like brush from the metal backing strip has shown itself to be unbalanced in construction, so that during brushing even very strong vibration has sometimes appeared in the brushing machine itself.

Previous experiments have also been made to manufacture the brush element entirely from plastic, but the parts corresponding to the bristle fibres in a brush made by the spray moulding technique have not withstood brushing, due to the fact that the fibres of the brush element must be absolutely orientated fibres in order to withstand hard wear and orientation cannot be achieved in the fibres by the spray moulding technique.

It is the intention of this invention to present a method of attaching the brush fibres to a plastic backing strip, when with the aid of the method it is possible to produce brush elements more economically, and in which the fibres will definitely remain attached to the backing strip, and which at the same time are also more balanced in construction also in cylinder-like brush form. By this method it is also possible to achieve backing strips that are dimensionally very exact compared to the corresponding metal ones and the weight of the brush part of a brushing machine lightened by 15-30% in which case the transmission equipment of the brushing machine is subject to smaller stress.

It is characteristic of the invention that a molten plastic mass is first sprayed on top of the joined brush fibres and that the preform thus created is placed in an open form in such a way that when the forms are closed the molten plastic mass is squeezed into the

shape of the form and at the same time fills the gaps between the fibres in the backing strip.

The spraying of the plastic mass into a closed form carried out by spray moulding technique does not succeed in this case, because the molten plastic mass extrudes between the fibres before the form-shaped cover part is completely filled with the plastic mass.

In what follows the invention is described in detail with the aid of an example by referring to the accompanying drawings in which,

Figure 1 shows the spraying of the plastic mass on top of the bristle fibre ribbon in accordance with the invention

Figure 2 shows a cross-section of pre-sprayed form with the molten plastic mass prior to the form being closed. The example is from the manufacture of a cylinder-like brush component

Figure 3 shows a cross-section when the halves of the form are closed, when the plastic mass distributes itself in accordance with the form forming the solid backing part of a plastic brush sheet.

Figure 4 shows a finished brush element.

In Figure 1 shows the spraying of the plastic mass on top of the brush fibres. From the one end the fibre ribbon 1 manufactured from fibres melted or glued together is transported for example between two turning conveyor belts under nozzle 2, which simultaneously squeezes the ribbon-like molten plastic mass 3 on top of the fibre ribbon in such a way that the plastic mass is bent by about 20-30 mm on either side of the fibre ribbon. The thickness of the molten plastic strip is 2-15 mm depending on the volume of the backing part of the brush component.

A length of the preform thus formed is cut as required and bent around the lower part 4 of the form shown in Figure 2.

The upper form 5 is pressed against the lower form 4 in accordance with Figure 3, when the plastic mass is squeezed into the shape of the form at the same time filling the gaps between the fibres in the backing strip and thus the solid plastic backing strip 6 is formed.

If required e.g. metal reinforcing pieces or securing pieces can be placed in the preform to be squeezed before the halves of the form are pressed together.

It is clear to a tradesman acquainted with the field that the size and form of the brush elements manufactured by the method according to the invention can be varied within extremely large limits, which concerns fibre materials or their dimensions. Other products too, e.g. plastic ski-slope elements, street brooms, etc. can be manufactured by the same method. The construction of the equipment and forms in accordance with the invention can also be varied correspondingly within the framework of the invention in many ways.

In a finished brush element the fibres (8) are firmly fixed inside the backing strip (6), figure 4. When attaching the brush element to an axle a tooth (7) is formed in it. This can be formed either directly in the form or as above by a reinforcing component added to the preform.

Claims

1. A method of manufacturing a plastic-framed brush element, in which the brush element consists of a backing part (6) formed of plastic mass and brush fibres (8) or bristles placed inside this from one end, and in which method plastic plastic mass (3) is sprayed on squeezed on top of of a ribbon (1) formed of brush fibres joined together at one end, to form a perform, **characterized in that** a length of the perform thus formed is placed in an open form, preferably on a lower form part (4), after which the form is closed, preferably by means of an upper form part (5), when the plastic mass (3) is pressed to form a backing part (6), in which the plastic mass (3) substantially fills the gaps between the fibres (8).

2. A manufacturing method in accordance with Claim 1, **characterized in that** a reinforcing or securing part is added to the preform made of the fibre ribbon (1) and the plastic mass (3) before the form is pressed together.

3. A manufacturing method in accordance with Claims 1 or 2, **characterized in that** the preform is placed to form a ring with the aid of a ring form (4, 5) suitable for this, in which case the finished brush element forms a ring.

Ansprüche

1. Verfahren zur Herstellung einer Bürsteneinheit mit Kunststoffrahmen, wobei die Bürsteneinheit gebildet ist aus einem aus Kunststoffmasse gebildeten Trag- bzw. Stützteil (6) und innerhalb desselben einendig angeordneten Bürstenfasern (8) bzw. Borsten, und wobei zur Ausbildung einer Vorform bzw. eines Halbfertigfabrikats eine plastische Kunststoffmasse (3) auf die Oberseite eines aus einendig miteinander verbundenen Bürstenfasern gebildeten Bandes (1) gesprüht oder ausgepreßt wird, **dadurch gekennzeichnet**, daß eine Länge der so ausgebildeten Vorform in einer offenen Form, vorzugsweise in einem unteren Formteil (4), angeordnet wird, daß anschließend die Form, vorzugsweise mittels eines oberen Formteils (5), geschlossen wird, wenn die Kunststoffmasse (3) zur Ausbildung eines Trag- bzw. Stützteils (6) ausgepreßt wird, wobei die Kunststoffmasse (3) die Lücken zwischen den Fasern im wesentlichen ausfüllt.

2. Verfahren nach Anspruch 1, **dadurch gekenn-**

zeichnet, daß zur Vorform ein aus einem Faserband (1) und Kunststoffmasse (3) gefertigtes Verstärkungs- bzw. Sicherungsteil hinzugefügt wird, bevor die Form zusammengepreßt wird.

3. Verfahren nach Anspruch 1 oder 2, **dadurch gekennzeichnet**, daß die Vorform so angeordnet bzw. ausgebildet wird, daß sie mit Hilfe einer hierfür geeigneten Ringform (4, 5) einen Ring bildet, wodurch die fertige Bürsteneinheit einen Ring bildet.

Revendications

1. Procédé de fabrication d'un élément de brosse avec cadre en plastique dans lequel l'élément de brosse consiste en un support (6) formé d'une masse en matière plastique, et de poils ou fibres de brosse (8) plantés dans ce support par l'une de leurs extrémités, la Procédé consistant à disperser et presser une masse plastique sur le côté supérieur d'un ruban (1) formé de fibres de brosses jointes les unes aux autres à l'une de leurs extrémités en vue de former une forme préliminaire (préforme), caractérisé en ce qu'une longueur de la préforme ainsi formée est placée dans une forme ouverte, de préférence dans une partie inférieure de la forme (4), qu'ensuite la forme est fermée, de préférence au moyen d'une partie supérieure de la forme (5) lorsque la masse plastique (3) est pressée en vue de former un support (6) dans lequel la masse plastique (3) comble substantiellement les vides entre les fibres (8).

2. Procédé de fabrication selon la revendication 1, caractérisé en ce que une pièce de renforcement ou d'arrêt est ajoutée à la préforme faite du ruban des fibres (1) et de la masse plastique (3) avant que la forme soit fermée.

3. Procédé de fabrication selon la revendication 1 ou 2, caractérisé en ce que la préforme est disposée de manière à former un anneau à l'aide d'une forme en anneau (4, 5) appropriée, en vue de former un élément de brosse en anneau.

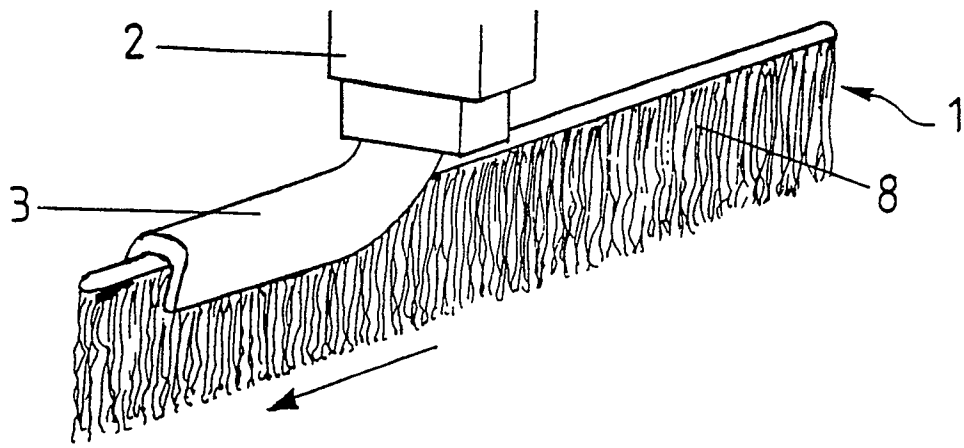


FIG. 1

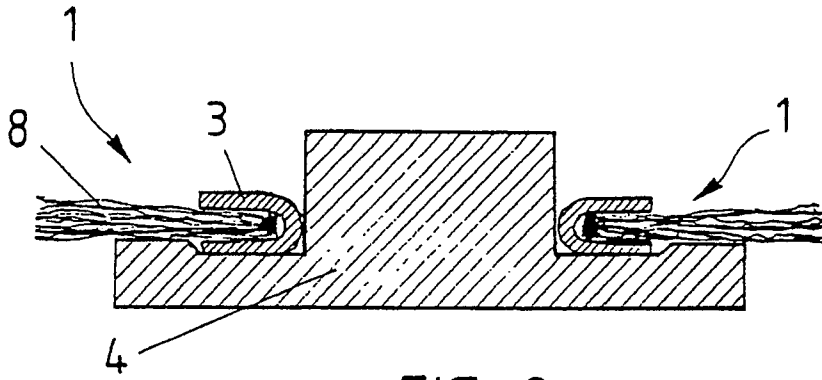


FIG. 2

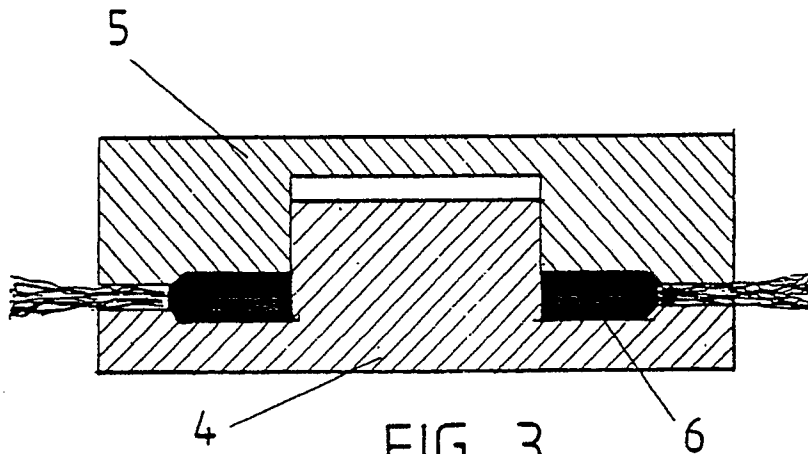


FIG. 3

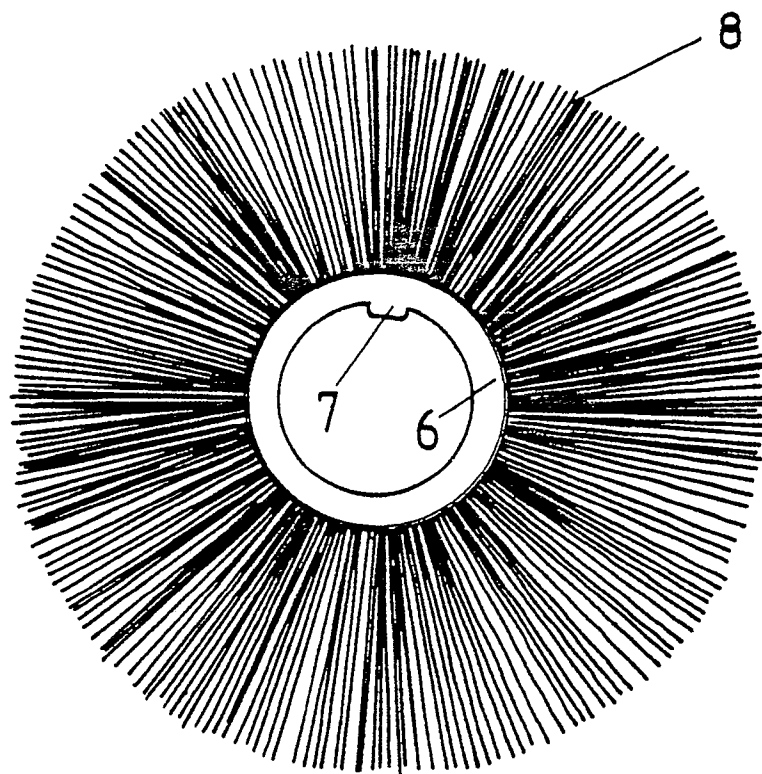


FIG. 4