

Dec. 1, 1925.

1,563,367

J. A. HULTQVIST

METHOD OF MANUFACTURING ARTICLES OF BRUSH LIKE NATURE

Filed Dec. 18, 1922

2 Sheets-Sheet 1

Fig. 1.

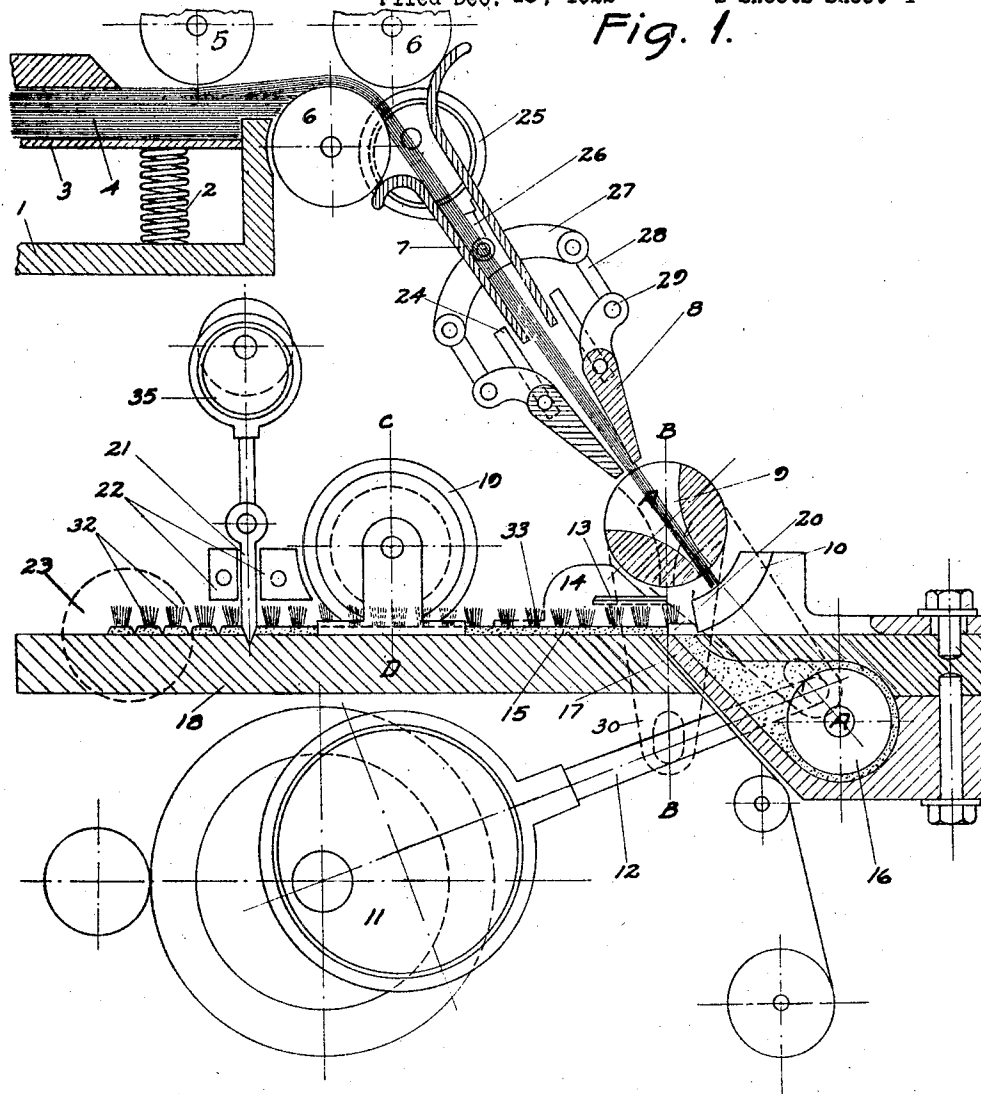
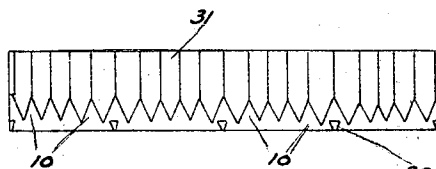


Fig. 3.



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2 Sheets-Sheet 2

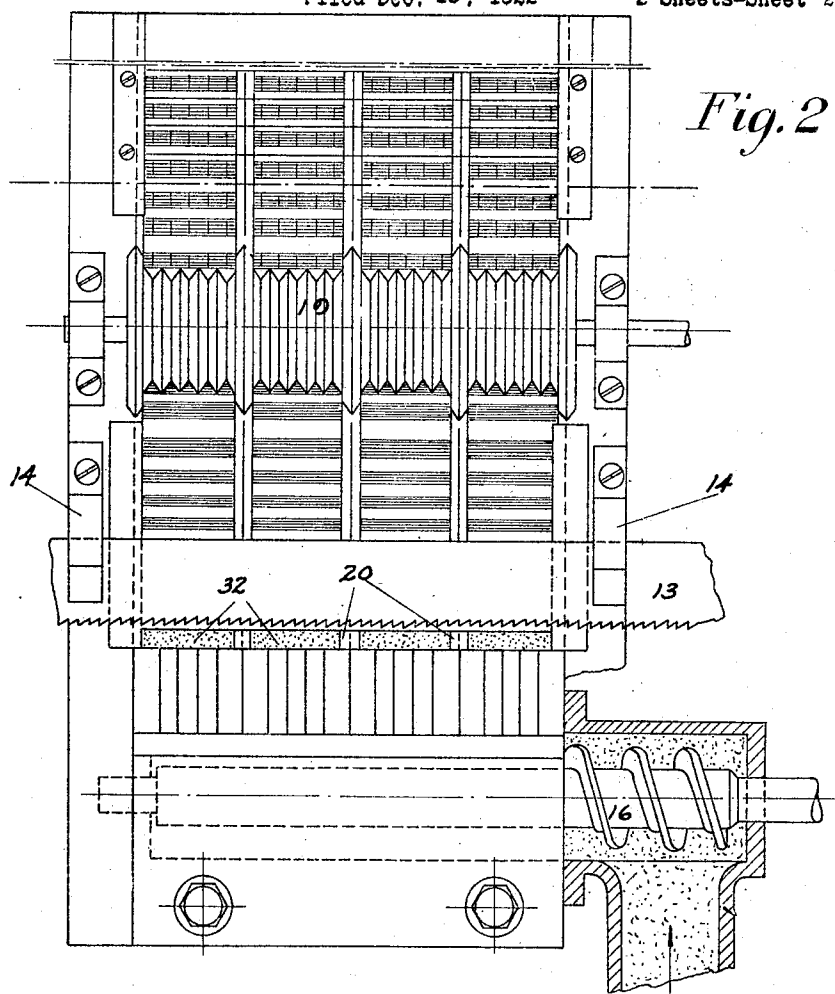
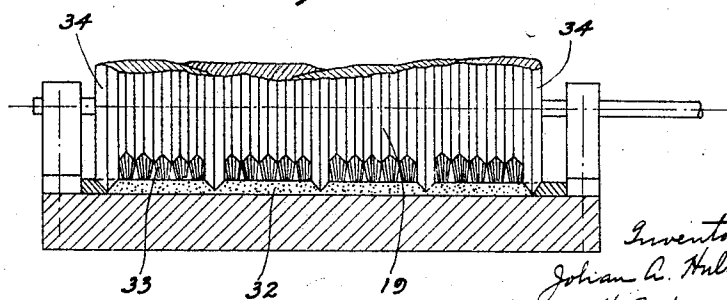


Fig. 4.



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UNITED STATES PATENT OFFICE.

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METHOD OF MANUFACTURING ARTICLES OF BRUSHLIKE NATURE.

Application filed December 18, 1922. Serial No. 607,686.

To all whom it may concern:

Be it known that I, JOHAN ARTHUR HULTQVIST, a citizen of the Kingdom of Sweden, residing at Norrköping, Sweden, have invented certain new and useful Improvements in Methods of Manufacturing Articles of Brushlike Nature, of which the following is a specification.

The invention refers to a method of manufacturing articles of brush like nature such as brushes, carpets and the like from a suitable fibrous material, threads, yarn and the like, and is characterized by the fact, that said fibrous material is introduced into a plastic binding mass, which in a suitably thick layer is fed on a table, the fibrous material being thereafter cut to the desired height over said layer of plastic mass. If brushes are to be manufactured one or more bundles of fibre are fed through a feeding device intersecting one or more strips of binding plastic mass, whereby according to one method the bundles of fibre are introduced from the side into the plastic mass, which is fed on the table. A knife or a saw cuts the bundle thus introduced in the binding mass, strip or sheet to the desired height. If the brush is to be provided with a plurality of small bundles of fibre, as is usual in tooth brushes, a bundle of fibre with a breadth corresponding to the length of the brush, is fed through the feed device to a distributing or dividing device, by means of which the bundle of fibre is divided into the desired number of smaller bundles, which by the feeding device are transported to the table simultaneously with the plastic mass, so that the bundles of fibre are secured in position in said plastic mass, which has the property of hardening or setting relatively quickly. The mass with the divided bundles thereafter is cut on the table in pieces of desired size, corresponding to the size of the brushes, whereby by means of a cutter the free ends of the bundles of fibre may be given any desired shape, and loose hairs of fibre and the like may be removed.

In order to illustrate the invention a suitable device for carrying the invention into practice is shown on the accompanying drawings, said device being adapted for the manufacture of tooth brushes.

Fig. 1 shows the device in side elevation partly in vertical section. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a cross section on

the line A—A and Fig. 4 a cross section on the line C—D in Fig. 1.

1 indicates a box, the bottom 3 of which is supported by springs 2 and which forms a receiver for the fibres 4, from which the brushes are to be manufactured. 5 indicates a feeding roller for feeding the fibres to the regulating rollers 6, which regulate the thickness of the bundle of fibre, which has a breadth, corresponding to the desired number of brushes. Said bundle of fibre is introduced by the regulating rollers 6, 6 in the fibre channel 7, at the lower end of which the bundle is gripped by the grippers 8, which preferably are reciprocating. The grippers 8 are opened and closed during said reciprocating movement, being guided in guides 24 and receiving their motion from the eccentric 25, the movement of which is transmitted to the grippers by the link system 26, 27, 28, 29.

Beneath the grippers 8 an oscillating feeding device, actuated by the eccentric 11 and the links 12, 30, in the shape of a roller 9 is placed, said rollers being perforated or slotted transversely, as shown, in order to receive the bundle of fibre so that said bundle may be introduced through the roller, when occupying the position shown. The lower end of the bundle which extends through the roller 9 thereby is introduced in a distributing or dividing device, which as shown in Fig. 3 consists of a number of edges 10 facing the feeding roller 9, by means of which the bundle is divided into a corresponding number of smaller bundles 31, when the roller 9 rotates in the direction of the arrow.

While the above mentioned feeding of the fibre bundle is being performed, the plastic material is being forced up by means of the rotating screw 16 through the nozzle 17 to the usual traveling belt of table 18, forming a sheet or strips 15 thereon, said plastic material being of such composition as to be quickly self-setting or self-hardening when exposed to the atmosphere. The ends of the bundles or tufts of fibre as they leave the distributor or divider 10 are forced into the plastic mass as the latter is forced up through the mouth or nozzle 17, the adjacent face or edge of the device 10 being in contact with said plastic mass and the serrations in device 10 extending below the plane of the surface of the said plastic mass as thus forced up, thus maintaining the indi-

viduality of the tufts or bundles of fibre as formed by said distributor 10.

This feeding and insertion of the fibre in the plastic mass occurs intermittently and regularly and results in producing a plurality of fibre, brush or tufted strips 32.

By means of plates 20 extending from the dividing device or distributor 10 across the nozzle 17 the plastic mass as it issues from said nozzle 17 may be divided into a plurality of thin quick-setting plastic sheets 15, or the whole may be left a single continuous sheet.

When the roller 9 with the bundles of fibre divided by the dividing device 10 has reached the dotted position B—B Fig. 1, the plastic material of the strips or sheets 15 will have hardened or set and the bundles are cut on a suitable level by the knife or saw 13, which may be reciprocating or constitute an endless band, and which may be adjusted and guided by the guides 14 on the machine standard.

The plastic mass 15 which now has hardened with the bundles of fibre 33 secured in the same is carried forward on the table 18 beneath a grinder 19, which as shown in Fig. 4, serrates the upper part or the free ends of the bundles 33, as common in tooth brushes, while simultaneously other parts of the grinder plates 20 grind the end edges of the strips 32. The grinder 19 for this purpose is composed of a number of grinder rings 34 of larger diameter than the parts of the grinder, journaled between said rings 34, as clearly shown in Fig. 4.

From the grinder 19 the hardened mass 15 to be divided into strips 32 with the bundles of fibre 33 is carried forward beneath a reciprocating knife 21, which is adjusted and guided by the guides 22, said knife cutting the strips 32 from one another as shown on the left side of Fig. 1. The brush now has the shape shown by the cross section in Fig. 1 and the longitudinal section in Fig. 4 of the strips 32.

23 indicates a pipe for an air jet, by means of which adhering loose hairs and the like may be removed.

The brushes thus manufactured may be introduced or secured in a suitable manner into a handle or the like, and may if desired be prepared with a suitable tooth paste.

The dividing device 10 is necessary only in cases where it is desired to divide the bundle of fibre into a number of smaller bundles 31. The cutter 19 and the air pipe 23 may be dispensed with.

When manufacturing carpets the devices for dividing the bundle of fibre are dis-

pensed with. The binding plastic mass is not divided by means of plates 20, but is fed in a single sheet on the table. The machine may be provided with a number of feeding devices 9 for different coloured fibres, and may be arranged for fibres passing through the mass by changing the distributing device 10 in a corresponding manner.

Having now particularly described my invention, what I claim is.

1. The method of manufacturing articles of brush like nature comprising the feeding of a plastic mass into sheet form, the movement forward of said sheet, and the forwardly feeding and insertion of a plurality of distinct bundles of fibres in said plastic material in its plastic state at the point where it is being fed.

2. The method of manufacturing articles of brush like nature comprising, the feeding of a plastic mass into sheet form, the steady progressive movement forward of said sheet, and the regular intermittent forwardly feeding and insertion of a plurality of fibres in said plastic material in its most plastic state to form spaced strips of fibres held in said plastic sheet.

3. The method of manufacturing articles of brush like nature comprising, the feeding of a plastic mass into sheet form, the steady progressive movement forward of said sheet, the intermittent forwardly feeding and insertion of a plurality of distinct bundles of fibres in said plastic material in its most plastic state, the initial severing of the fibres at the desired height as each feeding and insertion operation of the fibre is completed, and the subsequent trimming of the free ends of the fibres to the desired shape.

4. The method of manufacturing articles of brush like nature comprising, the feeding of a plastic mass into sheet form, the steady progressive movement forward of said sheet, the intermittent forwardly and downwardly feeding and insertion of a plurality of distinct bundles of fibres in said plastic material in its plastic state, the severing of the fibres at the desired height as each feeding and insertion operation of the fibre is completed, the trimming of the free ends of the fibres to the desired shape, whereby a plurality of distinct fibre strips are formed, and finally, the severing of the individual strips of fibre supplied plastic material from each other.

In testimony whereof, I have signed my name to this specification.

JOHAN ARTHUR HULTQVIST,