July 24, 1928. 1,677,920

C. R. HUBBARD

METHOD OF MAKING BRUSHES

Filed June 11, 1927

Fig. 1.

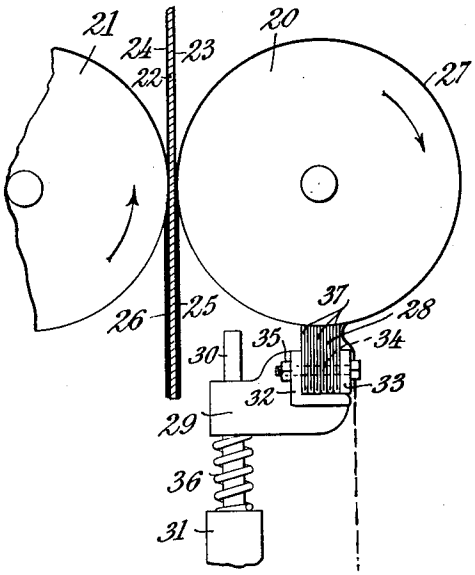


Fig. 2.

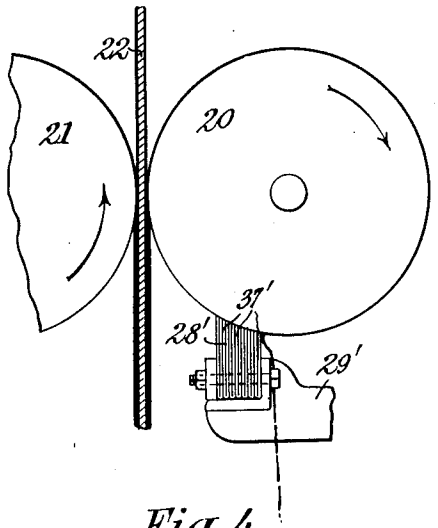


Fig. 3.

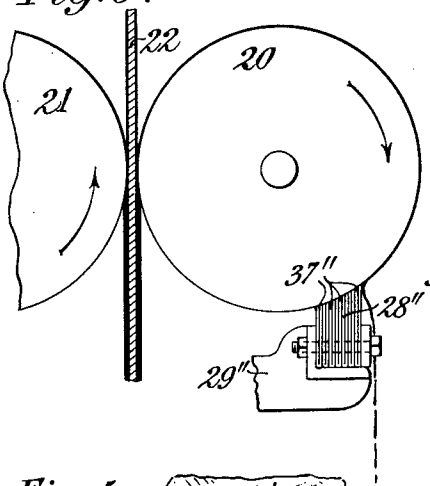


Fig. 4.

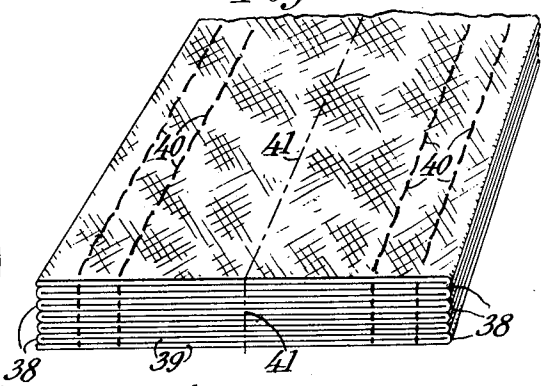


Fig. 6.

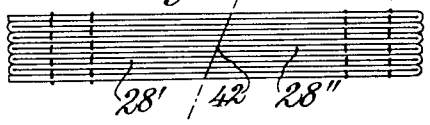


Fig. 5.

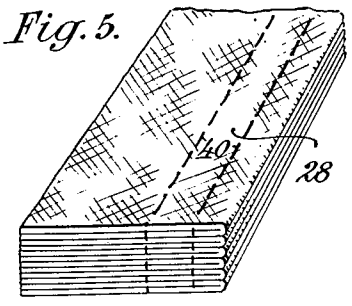
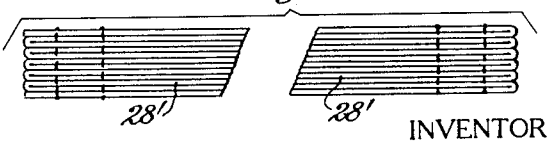


Fig. 7.



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UNITED STATES PATENT OFFICE.

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METHOD OF MAKING BRUSHES.

Application filed June 11, 1927. Serial No. 198,076.

This invention relates to improvements in methods of making brushes. Although adapted for general application, it is herein disclosed as applied to methods of making heat-resistant brushes adapted for use in cleaning tin from tinning rolls used in the process of coating metal plates with tin.

It is an object of the invention to simplify and reduce the manual labor involved in assembling and securing the layers of material of which brushes of this character are made.

It is a further object of the invention to produce a brush the respective layers of which may be more uniformly assembled in registration with each other and more firmly clamped together.

Another object of the invention is to produce a brush having an even and well-defined working surface which may be either at right angles to the layers of material of which the brush is composed, or at any desired degree of inclination with respect to such layers.

It is a still further object of the invention to produce brushes in pairs which shall be duplicates or substantial duplicates of each other as to form, size, material and construction.

In the accompanying drawings used as an aid in disclosing the method of making brushes in acordance with the invention:

Figure 1 is a conventional representation in end view of a pair of squeezing rolls such as are commonly used in plate-coating machines, one of said rolls being indicated as partly broken away and the other as having a brush and brush-mounting means whereby the brush may be held in proper position to remove excess tin from the surface of the roll.

Figs. 2 and 3 are similar views of corresponding parts of tinning machines, the brushes being represented in different relative positions with respect to the axis of the machine than that of the brush illustrated in Fig. 1.

Fig. 4 is a perspective view of a sheet of material folded into a structure having a plurality of superimposed layers and secured together in readiness to be severed lengthwise of the structure to form one or more brushes. In this figure the plane of severance is indicated as being perpendicular to the layers of the folded structure.

Fig. 5 is a similar view of one of a pair of brushes which may be produced by severing the folded structure, illustrated in Fig. 4, intermediate its folded margins.

Fig. 6 is a view in cross-section through a folded strip of material similar to that illustrated in Fig. 4, the strip being indicated as being severed along a plane disposed at a somewhat different angle with respect to the component layers of the structure than that indicated in Fig. 4.

Fig. 7 illustrates in cross-section two duplicate brushes which may be formed by severing the folded structure shown in Fig. 6.

In the coating of sheets of metal with tin, it is common practice to pass the metal sheets into and out of a bath of molten tin, over which is floated a bath of oil, and to provide within the oil bath, above the surface of the molten tin, one or more pairs of squeezing rolls by means of which the coated sheet is elevated from the bath and at the same time relieved of excess tin as it is passed between the rolls. The excess tin which is transferred from the surface of the plate to the surfaces of the rolls is commonly removed by brushes provided with suitable mounting means by which they may be yieldingly held against the surface to be cleaned.

In Fig. 1 of the drawings, 20 represents one of a pair of squeezing rolls of the above-described character, 21 being a fragmentary portion of the complementary roll of the pair. 22 represents, in cross-section, a plate of metal indicated as being fed upwardly between said rolls as they are rotated in directions indicated by the arrows. It is a function of the rolls 20, 21 to permit films 23, 24 of tin of uniform predetermined thickness to pass beyond their lines of contact with the coated plate, the excess tin of the films 25, 26 being caused to fall or run back into the bath.

In order to remove any excess tin which is carried by the surface of a roll beyond its line of contact with the coated plate, a film of which is indicated at 27 in Fig. 1, a brush 28 is usually held in close contact with the surface of the roll, by which the surface is wiped clean before it is again brought into contact with the coated plate. A conventional representation of a mounting means for such a brush is illustrated in Fig. 1 as

comprising a brush-holder 29 slidably mounted upon a guide-bar 30 projecting upwardly from a support 31 which may be secured to any stationary part of the structure. The brush may be clamped between a seat 32 in the holder and a clamping plate 33 by securing means of any appropriate character, such as the bolt 34 and nut 35, and the holder may be caused to hold the brush in yielding contact with the surface of the roll by means of a suitable spring 36.

In Fig. 1 the brush is indicated as being mounted directly below the axis of rotation of the roll, so that the working surface of the brush is substantially perpendicular to the laminations 37 of which such brushes are usually built up.

In Fig. 2 the brush-holder 29′ is so positioned as to maintain the brush 28′ in a position somewhat closer to the point of contact between the roll and the plate, the brush having a working surface disposed at an inclination to its laminations 37′

In Fig. 3 the brush-holder 29″ is so positioned as to maintain the brush 28″ at a somewhat greater distance from its line of contact with the plate, the working surface of the brush being appropriately inclined with respect to its laminations 37″ to make snug contact with the surface of the roll.

Tinning machines employing pairs of squeezing rolls having brushes held in contact with their surfaces to remove excess tin are well known in the art and constitute no part of the invention herein sought to be protected, which relates to brushes which, if made of appropriate material, are adapted for use in the cleaning of tinning rolls, and to a method whereby such brushes may be constructed.

In its broadest aspect the method of making brushes in accordance with this invention consists in folding a strip of material, or a plurality of said strips, into a structure comprising a plurality of superimposed layers, said structure having folds along two margins, and, after firmly securing the layers together, severing the folded structure between said folded margins to produce one or more brushes in which the severed edges of the material all lie in a substantially plane surface. The building up of the laminated structure, from which the brush is to be made, by folding a single strip of material to produce the laminated structure and in securing the layers together before the cut is made which produces the working surface of the brush, requires much less manual labor than is involved when brushes are made by superimposing separate strips of material cut to sizes intended for use in the finished brush. The securing of the layers may be more readily effected if the laminated structure is made by folding a single piece of material, the working surface formed by cutting the folded structure is far more uniform than that which can be produced by attempting to superpose and secure together a number of previously cut strips of material, and the brush formed by folding and securing the material before the cut is made which produces the working surface is less likely to become distorted under strains incident to use.

Although the invention consists essentially in the making of brushes from folded material severed between the folds, it will be obvious to those skilled in the art that two or more sheets of material may be used to build up the folded structures when required by the size or form of brush to be produced.

One method of constructing a brush in accordance with the invention will be described with the aid of Figs. 4 and 5 of the drawings. A sheet of any suitable material, perferably asbestos fabric, is folded into a structure comprising a plurality of closed accordion plaits, each plait comprising a folded marginal portion 38 and intermediate layers 39. The folded material is then firmly secured together in any appropriate manner, such securing means being herein indicated as rows of stitching 40 preferably disposed in parallel relation with the folded margins of the plaits. The folded and stitched structure may then be severed intermediate the folded margins to produce one or more finished brushes, a suitable plane of severance for such purpose being indicated in broken lines at 41, Fig. 4. If but one brush is to be constructed from each folded structure, this plane of severance may be relatively close to one of the folded margins of the structure. Preferably a single folded structure will be made of sufficient size to be cut into at least two brushes. As indicated in Fig. 4, the plane of severance is shown as being midway between the folded margins and perpendicular to the planes separating the layers of material. The severing of the structure along a plane of severance such as that indicated in Fig. 4 results in two brushes of equal size, form, material, and structure. One such brush 28, as indicated in Fig. 5, is adapted for use in a relative position with respect to the tinning roll illustrated in Fig. 1.

In Fig. 6 a folded structure, similar to that indicated in Fig. 4, is represented as having been severed along a plane of severance 42 at a slight inclination to the planes separating the layers of the structure, thereby resulting in two brushes 28′, 28″, either of which is adapted for use in a position relative to a tinning roll indicated either in Fig. 2 or in Fig. 3.

It will be apparent that brushes of the above described character can be made of any appropriate material. When used as cleaning brushes for tinning rolls, they

should be of heat-resistant material, such as asbestos fabric. When made of fabric, the material should preferably be folded on the bias as indicated by diagonal lines in Figs. 4 and 5.

Although parallel lines of stitching have been shown as the preferred means of securing the layers of the folded structure together, it will be obvious that the stitching need not necessarily run in parallel lines, and that staples or other appropriate fastening means might be used instead of stitching.

When it is desired to make two like brushes from each folded structure, fastening elements will be located along the folded margins at suitable distances therefrom and between the margins and the longitudinal center line of the structure. Preferably this stitching will be located at a material distance from the plane of severance in order that ample material may be allowed to provide for a wearing away of the working surface of the brush without bringing the fastening elements into contact with the surface against which the brush is used.

The invention is not intended to be limited to the specific manner of practicing the method herein selected for purposes of illustration, but should be regarded as covering modifications and variations thereof within the scope of the appended claims.

What is claimed is:

1. The method of making brushes, which consists in folding sheet material into a structure having a plurality of superimposed layers and having folds along two margins, securing said layers together, and severing the structure intermediate said folded margins.

2. The method of making brushes, which consists in folding sheet fabric on the bias into a structure comprising a plurality of superimposed layers and having folds along two margins, securing said layers together, and severing the structure intermediate said folded margins.

3 The method of making brushes, which consists in folding sheet material into a structure having a plurality of superimposed layers and having folds along two margins, stitching the layers together, and severing the structure intermediate it folded margins.

4. The method of making brushes, which consists in folding sheet material into a structure comprising a plurality of closed accordion plaits, securing the plaits together, and severing the plaited structure intermediate the marginal folds.

5. The method of making brushes, which consists in folding sheet fabric into a structure comprising a plurality of closed accordion plaits, the fabric being folded on the bias, securing the plaits together, and severing the plaited structure intermediate the marginal folds.

6. The method of making brushes, which consists in folding sheet material into a structure comprising a plurality of closed accordion plaits, stitching said plaits together, and severing the plaited and stitched structure intermediate the folded margins.

7. The method of making brushes, which consists in folding sheet material into a structure having a plurality of superimposed layers and having folds along two margins, securing said layers together, and severing the structure midway between said folded margins to produce a pair of duplicate brushes.

8. The method of making brushes, which consists in folding sheet material into a structure comprising a plurality of closed accordion plaits, securing the plaits together, and severing the structure midway between its folded margins to produce a pair of duplicate brushes.

9. The method of making heat-resistance brushes, which consists in folding sheet asbestos fabric into a structure comprising a plurality of closed accordion plaits, stitching said plaits together lengthwise of the folded structure between its longitudinal center line and its folded margins, and severing the structure midway between said margins to produce a pair of duplicate brushes.

In witness whereof, I have hereunto signed my name.

CECIL R. HUBBARD.