Jan. 29, 1957 H. P. McMILLAN 2,779,043

FERRULE ASSEMBLY FOR PAINT BRUSHES

Filed Dec. 10, 1951

Fig. 1.

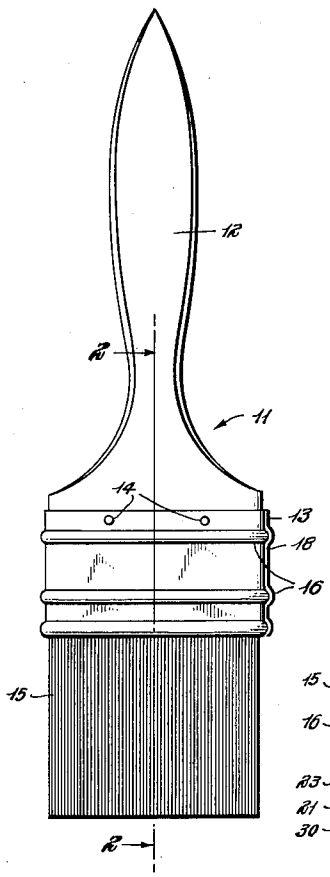


Fig. 2.

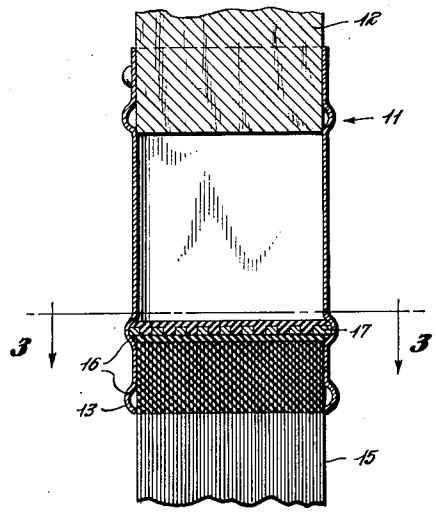


Fig. 3.

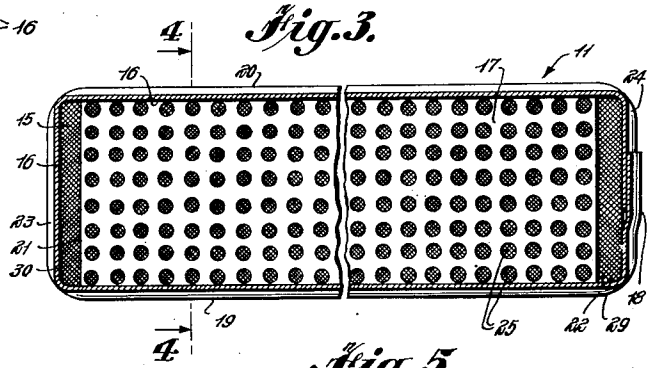


Fig. 4.

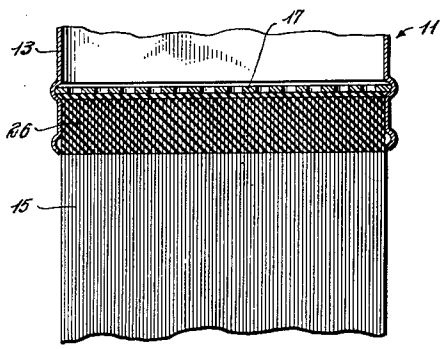
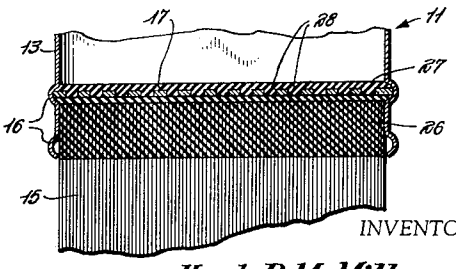


Fig. 5.



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FERRULE ASSEMBLY FOR PAINT BRUSHES

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5 Claims. (Cl. 15—193)

This invention relates to brush construction and particularly concerns a simplified and improved ferrule assembly having a novel handle receiving and bristle securing unit.

It is well known to secure bristles in a brush ferrule with adhesive plastic material, thereby to provide low quality and low cost constructions. Considerable difficulty has been experienced, however, in manufacturing high quality brushes at reasonable cost by reason of the problems encountered in securely retaining the bristles so they will not shed. While schemes have heretofore been suggested, none has offered a feasible method of manufacturing reasonably priced quality brushes.

An important object of the present invention is to provide an improved high quality brush with bristles firmly and securely retained in the ferrule and having no tendency to shed singly or severally.

A further object of the present invention is to provide a high quality brush construction which may be manufactured at reasonable cost.

Another object of the present invention is to provide a brush having a bristle and handle securing unit made of a plurality of parts easily and inexpensively manufactured and readily assembled.

In the attainment of these and other objects, one of the major features of this invention resides in forming the brush ferrule with channels arranged to provide a socket for a plate which may be snapped into position and securely held in the ferrule without additional fastening means. Another feature concerns embedding the butt ends of the brush bristles in plastic material and cementing the integral mass to the plate locked in the ferrule thereby providing a rigid, durable and easily assembled construction.

Other objects and advantages will appear from the following description when read in the light of the accompanying drawings, wherein:

Fig. 1 is a side view of a completely assembled brush having a ferrule unit constructed in accordance with the present invention.

Fig. 2 is a partial vertical section taken along lines 2—2 of Fig. 1.

Fig. 3 is a horizontal section taken along lines 3—3 of Fig. 2, with the upper layer of plastic material absent.

Fig. 4 is a vertical section taken through a ferrule unit embodying the features of this invention as it appears during an intermediate state of manufacture.

Fig. 5 is a similar vertical section taken through the same ferrule unit as it appears during a later intermediate stage of manufacture.

In the preferred form of this invention illustrated in Fig. 1, brush **11** has a handle **12** which is secured within an elongated ferrule **13** as by nails **14**. Bristles **15** are contained within the ferrule **13** and extend therefrom as in the conventional manner shown.

Ferrule **13** is formed on its inner surface with channels **16** around its walls, the channels being disposed in a plane perpendicular to the longitudinal axis of the brush. One of these channels provides a socket for a separate plate **17** (Fig. 2) within and disposed transversely of the ferrule **13**.

Preferably, the ferrule of this invention is constructed from blanks of resilient material preformed with channels and shaped into the tubular form shown in Fig. 3. Lap joint **18** or any similar joint may be used to secure together the butt ends of the blank and thereby provide a rigid, elongated tubular structure. Opposite walls **19**, **20**, however, retain the inherent flexibility and resiliency of the ferrule material by reason of their extended length, which permits inward and outward movement of the walls **19**, **20**, and temporary distortion from the regular tubular form of the ferrule.

By the present invention, the lateral width of plate **17** is made greater than the width of the ferrule above and below the portions provided with channels **16**, the opposite side walls of the ferrule being so formed to accommodate the wide plate. Because of the resiliency of the ferrule walls **19**, **20**, plate **17** may be easily snapped into position in the socket provided by the channel **16** which is situated intermediate the open ends of the ferrule and spaced a short distance from the lower end of the ferrule, as viewed in Fig. 1, wherein it will be securely locked.

As illustrated in Fig. 3, ends **21**, **22**, of plate **17** are preferably spaced from the adjacent ferrule walls **23**, **24** respectively. This feature allows the rectangular plate **17** to be inserted sideways into the ferrule **13** and subsequently turned and snapped into position in the socket. But as other forms and constructions for plate and ferrule assembly having the interlocking feature disclosed may be utilized, equivalent arrangements may be adopted without departing from the intended scope of the invention as limited by the claims.

Figs. 4 and 5 disclose intermediate stages of manufacture of the completed brush shown in Fig. 1. Referring to Fig. 4, ferrule **13** appears in partial section with plate **17** locked by the resiliency of the ferrule walls in the socket provided by the channel **16**. Bristles **15** are contained in ferrule **13**, the flag ends extending therefrom, and the butt ends embedded in a layer of plastic material **26** present on the underside of plate **17**. Rubber or other similar adhesive plastic well known in the art may be utilized for the embedding material.

Fig. 5 shows a later stage of manufacture of the brush wherein additional plastic material comprising a layer **27** on the upper side of plate **17** and extending through perforations **25** (at **28**) and in the spaces **29**, **30** is used for securing the bristles **15** in the ferrule **13**. Taking the assembly in the form shown in Fig. 5 and fastening a brush handle therein to form the assemblage shown in Fig. 2 completes the manufacture of the brush.

Referring to the construction shown in Fig. 1 and Fig. 2, nails **14** perform an additional function to securing the handle **12** within the ferrule. In constructions well known in the prior art, nails, rivets or the like are used solely for securing a handle and are usually fastened transversely in the ferrule in the region of the mass of bristles contained therein. Nails or rivets driven through the mass of bristles are liable to split or cut the bristles, which results in the brush fingering during use.

The nails are disposed in the tubular ferrule in a region where no bristles are contained, therefore weakening or cutting of the bristles does not occur, and the serious disadvantages present in the prior art structures are eliminated.

It is usual in brush manufacture to provide a work table having a block with a cross sectional area corre-

sponding to the cross sectional area of the ferrule. The block is provided with a smooth flat upper surface and is of such a thickness that it extends into the ferrule to a point (when the ferrule is inverted) adjacent the lower or bristle edge of the socket providing channels.

In manufacturing the brush of this invention a knot of bristles is inserted to be contained in the ferrule with their butt ends adjacent the handle end or upper edge of the ferrule and their flag ends extending from the lower end of the ferrule. The ferrule is then inverted and forced down over the block which serves to displace the bristles and position the knot with the butt ends of the bristles adjacent the lower edge of the channels.

After removing the ferrule from the block, plastic material is poured in the handle end of the ferrule over the mass of bristles. Sufficient plastic material is used to provide a layer of substantial thickness extending over the cross sectional area of the ferrule and embedding the butt ends of the bristles. The ferrule with the bristles in place is removed in its entirety and placed within a dry kiln to allow the plastic material to set.

In practise, after the plastic material has at least partially set, the perforated plate is snapped into place in the socket within the ferrule. The ferrule, with the perforated plate in place and the bristles embedded in the layer of plastic material adjacent the plate, is then positioned with the bristles extending downwardly and additional plastic material is poured into the upper end of the ferrule in sufficient quantity to provide a layer of substantial thickness on the upper side of the perforated plate with material extending through the perforations in the plate and into the areas adjacent the ends of the plate.

The ferrule, now containing the bristles and the perforated plate, is placed for complete drying in a kiln.

When the mass of plastic has set, the embedded bristles and the plate are securely bound within the ferrule. If desired, the perforated plate may be spot-welded, or similarly fastened, at one or several places along the edges to the ferrule. A handle of wood, plastic or similar material may then be secured in the ferrule unit with nails or the like to complete the brush manufacturing process.

Modifications may be effected without departing from the spirit of the invention as defined in the appended claims.

I claim:

1. In a brush, a ferrule having inner walls thereof channeled to form a socket, said socket being disposed intermediate the open ends of said ferrule, a separate perforated plate locked in the socket within and disposed transversely of said ferrule, the opposite end edges of said plate being spaced from the adjacent walls of said ferrule, plastic material comprising layers on the under and upper sides of said plate and extending through the perforations of the plate binding the layers together, and bristles having their butt ends embedded in the layer of plastic material on the underside of said plate.

2. A brush having a handle receiving and bristle securing unit comprising in combination, a ferrule having

the opposite walls thereof channeled to form a socket, said socket being disposed intermediate the open ends of said ferrule, a separate perforated plate locked in the socket within and disposed transversely of said ferrule, the opposite end edges of said plate being spaced from the adjacent walls of said ferrule, and plastic material comprising layers on the under and upper sides of said plate and extending through the perforations of the plate and into the area between the end portions of said plate and the adjacent walls of the ferrule binding the layers together, said layer of plastic material on the underside of said plate embedding the butt ends of the bristles.

3. In a brush: an elongated ferrule of resilient material having the opposite walls thereof channeled to provide a socket, said socket being disposed intermediate the open ends of said ferrule, said socket being disposed in a plane perpendicular to the longitudinal axis of the brush; a separate perforated plate locked in the socket within and disposed transversely of said ferrule, the opposite end edges of said plate being spaced from the adjacent walls of said ferrule; plastic material comprising layers on the under and upper sides of said plate and extending through the perforations of the plate and into the area between the end portions of said plate and the adjacent walls of the ferrule binding the layers together, and bristles contained in said ferrule and extending therefrom having their butt ends embedded in the layer of plastic material on the underside of said plate.

4. A brush having a handle-receiving and bristle-securing unit comprising in combination, a ferrule having the inner walls thereof channeled to form a socket, said socket being disposed intermediate the open ends of said ferrule, a perforated plate locked in the socket within and disposed transversely of said ferrule, an end edge of the perforated plate being spaced from the adjacent wall of the ferrule to permit the plate to be snapped into said socket, plastic material in the ferrule embedding said plate and the butt ends of the bristles, and means disposed in a bristle-free region of said ferrule for securing the handle in the ferrule.

5. In a brush, a ferrule having the inner walls thereof channeled to form a socket, said socket being disposed intermediate the open ends of said ferrule, a perforated plate locked in the socket within and disposed transversely of the ferrule, plastic material in the ferrule embedding the plate, and bristles having their butt ends embedded in plastic material on the underside of the plate, an end edge of said plate being spaced from the adjacent wall of the ferrule to thereby permit the plate to be snapped into the socket.

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